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Checklist of Mammals of Pakistan with particular reference to the Mammalian Collection in the British Museum (Natural History), London

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INTRODUCTION

Pakistan appeared on the map of the World as a sovereign and independent country in 1947 when the British India was liberated and partitioned. The entire literature pertaining to the period before Partition, deals with the British India as a whole—now called the Indo-Pakistan Subcontinent, and unfortunately the same is true of a good deal of post-Partition literature including Ellerman and Morrison-Scott's (1951) celebrated "Checklist of Palaearctic and Indian Mammals. For a person interested in the mammalian fauna of Pakistan it is very inconvenient to use such books especially if he is not fully familiar with the political geography of the Subcontinent. The demarcation of the range of distribution of a species in Pakistan can be done far more accurately and precisely if Pakistan alone is taken into consideration. The present checklist has been prepared to serve this purpose.

The preparation of a checklist of the mammals of Pakistan is by no means an easy task. Firstly, there is no collection of mammals in the country: the collections made during the British rule are housed either at the British Museum (Natural History) or in the Indian Museum. Secondly, the region now designated as Pakistan, has never been surveyed thoroughly. The present work, therefore, should be regarded as the first step towards the preparation of a comprehensive Fauna of Pakistan.

This checklist is based on the collection of mammals in the British Museum (N. H.) London. Apart from fairly comprehensive keys up to the sub-species, and actual measurements of the specimens available in the British Museum, detailed information regarding distribution and the collecting centres of the various species, has been given.

The present work, which forms a part of a thesis submitted to the University of London for the M.Sc. Degree in Zoology, was made possible through the award of a Fellowship under the Colombo Plan.

Order INSECTIVORA

GENERAL CHARACTERS:

Small terrestrial and placental mammals with the extremity of their muzzle projecting beyond the end of the mandible.

KEY TO THE FAMILIES

1. Back covered with spines; sutures in skull prominent; Zygomatic arch complete; bullae imperfect; first and second upper molars with a central fifth cusp on the crown.
   Dental formula: $i\ \frac{3-3}{2-2}, c\ \frac{1-1}{1-1}, pm\ \frac{3-3}{2-2}, m\ \frac{3-3}{3-3} = 36$ teeth.
   .....*Erinaceidae.*
2. Back covered with soft fur; sutures in skull not prominent or disappeared in early life; zygomatic arch slender or incomplete; first and second upper molars with no central fifth cusp on the crown. Dental formula: varying (given under genera).
   (*a*) External ear present; zygomatic arch absent; bullae imperfect; anterior lower incisor greatly elongated in the axis of the jaw .....*Soricidae.*
   (*b*) External ear absent; zygomatic arch present; bullae perfect; anterior lower incisor not elongated. ....*Talpidae.*

Family ERINACEIDAE

KEY TO THE GENERA

1. No median parting of spines on the crown; pterygoids and tympanic bullae normal. ....*Hemiechinus* Fitzinger.
2. Distinct parting of spines on the crown; pterygoids inflated and their cavities communicate with those of the tympanic bullae; parapterygoid fossae shallow.....*Paraechinus* Trouessart.

Genus *HEMIECHINUS* Fitzinger, 1866.

KEY TO THE SPECIES

1. A smaller form with the longest spine not more than 20 mm. .....*auritus collaris* Gray.
2. A larger form with the longest spine not less than 25 mm. .....*megalotis* Blyth.

Hemiechinus auritus collaris Gray, 1830. Long-eared Hedgehog.

1830. *Erinaceus collaris* Gray in Hardwicke, Illustr. Indian Zool. 1, pl. 8. Doab, between the Rivers Jumna and Ganges, India.

1832. *Erinaceus grayi* Bennett, P.Z.S. 123, Himalayan mountains (Type Adult (?) B. M. No. 55.12.24.82).

COLLECTING CENTRES (No. of Specimens): Wazirabad (1), Multan (2), Gambat (2), Mirpur (1), Sukkur (2), Hyderabad (1), Karachi (2), all in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: Specimens of this subspecies from Afghanistan, in the B. M. Collection, establish the continuity of its distribution through North-West Frontier areas of West Pakistan.

Hemiechinus megalotis Blyth, 1845. Afghan Hedgehog.

1845. *Erinaceus megalotis* Blyth, J. Asiat. Soc. Bengal, 14: 353 (Footnote). Kandahar, Afghanistan (Type skin none, only skulls B. M. Nos. 79.11.21.515 and 516 (Cotype) by Hutton).

COLLECTING CENTRES (No. of Specimens): Mastung (1), Jhelawan (1), Shahdangii (1), Surab (1), Baluchistan (1), all in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: This Palaearctic species extends into a part of the oriental region in Baluchistan (West Pakistan) and does not occur east of this area.

Skull measurements (in mm.) of the specimens of *Hemiechinus* spp. examined:

Brit. Museum No., Sex & Locality	Condylobasal length	Zygomatic Breadth	Mastoid Breadth	Post orbital constriction	Maxillary tooth-row (entire)
H. auritus collaris					
10.1.18.30, ♂, Multan (Punjab) ...	47.5	29.1	23.3	11.0	22.9
10.1.18.31, ♀, Multan (Punjab) ...	45.5	26.3	22.9	11.6	22.6
15.11.1.52, ♂, Sukkur (Sind) ...	48.0	...	24.4	12.6	24.3
15.11.1.54, ♂, Gambat (Sind) ...	47.6	29.9	23.5	11.8	23.6
80.12.15.11, ♂, Karachi (Sind) ...	48.0	28.5	23.5	12.1	23.9
91.10.7.47, ♀, Hyderabad (Sind) ...	47.5	29.8	23.4	12.2	23.4
Average ...	47.3	28.7	23.5	11.8	23.6

Brit. Museum No., Sex & Locality	Condylobasal length	Zygomatic Breadth	Mastoid Breadth	Post orbital constriction	Maxillary tooth-row (entire)
H. megalotis					
19.11.7.18, ♀, Jhelawan (Baluchistan)	53.0	32.5	25.2	13.6	24.6
19.11.8.4, ♂, Mastung (Baluchistan)	55.4	32.4	25.9	13.4	26.8
19.11.8.6, ♀, Surab (Baluchistan) ...	53.4	31.6	25.7	12.5	26.0
69.8.24.2, ♀, (Baluchistan) ...	51.6	...	23.9	12.4	25.6
Average ...	53.3	32.1	25.1	12.9	25.7

Genus *PARAECHINUS* Trouessart, 1879

KEY TO THE SPECIES

1. Colour of body paler; skull wider in the pterygoid region (pterygoid width not less than 54% of the length of skull); third premolar not three rooted (mostly two roots present). ....*micropus micropus* Blyth.
2. Colour of body darker; skull long and narrower in the pterygoid region (pterygoid width not more than 51% of the skull length); third premolar three rooted.
   (*a*) a larger form with condylobasal length not less than 50 mm. .....*hypomelas hypomeles* Brandt.
   (*b*) a smaller form with condylobasal length not more than 50 mm. .....*hypomelas blanfordi* And.

Paraechinus micropus micropus Blyth, 1846. Indian Hedgehog.

1846. *Erinaceus micropus* Blyth, J. Asiat. Soc. Bengal, 15: 170 Bhawalpur, Punjab, Northern India (Type skin none, only skull Adult (?) B. M. No. 79.11.21.517).

COLLECTING CENTRES (No. of Specimens): Gambat (4) and Karachi (3), West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: This is purely an oriental species, which confines to the dry and sandy areas of the Indo-Pakistan subcontinent.

Paraechinus hypomelas hypomelas Brandt, 1836 Brandt's Hedgehog.

1836. *Erinaceus hypomelas* Brandt, Bull. Sci. St. Petersb. 1: 32. Northern Persia.

1919. *Paraechinus amir* Thomas, Ann. Mag. N. H. 1: 232. Kandahar, Afghanistan. (Type Adult (?) B. M. No. 81.8.16.3).

COLLECTING CENTRES (No. of Specimens): Chib (Buleda) (1) and Khojdar (2), all in Baluchistan (West Pakistan).

HABITAT: Tropical thorn forests.

REMARKS: The specimens from Baluchistan in the B. M. Collection establish the range of this Palaearctic subspecies to include this area of West Pakistan. Ellerman and Morrison-Scott (1951) did not mention this in the Checklist.

Paraechinus hypomelas blanfordi Anderson, 1878.

1878. *Erinaceus blanfordi* Anderson, J. Asiat. Soc. Bengal, 47; 2: 208. Rohri, Sind, North-Western India (Type Adult ♀ B. M. No. 87.4.2.2; Skin in alcohol, Skull-complete).

1878. *Erinaceus jerdoni* Anderson, loc. cit. 209. Karachi, Sind, India (Cotype Adult ♀ B. M. No. 87.4.2.1; skin in alcohol, skull broken).

COLLECTING CENTRES (No. of Specimens): Peshawar (2), Ara (3), Chakri (1), Multan (2), Jacobabad (1), Sukkur (3), Naundero (2), all in West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Paraechinus* spp. examined:

Brit. Museum No., Sex & Locality	Condylobasal length	Zygomatic Breadth	Mastoid Breadth	Post orbital constriction	Maxillary tooth-row (entire)
P. micropus micropus					
79.11.21.517, (?) Bahawlapur (Punjab) Type ...	40.9	28.1	23.8	11.0	19.4
15.11.1.63, ♂, Gambat (Sind) ...	42.5	...	24.8	11.3	20.2
15.11.1.64, ♂, Gambat (Sind) ...	39.7	...	22.9	10.6	20.3
15.11.1.65, ♀, Gambat (Sind) ...	41.3	27.2	23.7	10.8	20.1
15.11.1.66, ♀, Gambat (Sind) ...	41.3	26.7	22.3	10.5	20.1
80.12.15.8, ♂, Karachi (Sind) ...	42.9	27.9	25.1	11.1	21.6
88.6.18.5, (?) Karachi (Sind) ...	40.7	25.3	22.4	11.1	20.0
91.10.7.48, ♀, Karachi (Sind) ...	...	...	....	9.9	20.4
Average ...	41.2	27.0	23.6	10.8	20.3
P. hypomelas hypomelas					
19.11.7.17, ♂, Chib (Baluchistan) ...	51.6	29.3	26.1	11.6	25.6
19.11.8.7, ♂ Khojdar (Baluchistan)	54.4	29.9	25.4	12.1	25.7
19.11.8.8, ♀, Khojdar (Baluchistan)	52.8	29.1	25.6	12.4	25.7
Average ...	52.9	29.4	25.7	12.0	25.7

Brit. Museum No., Sex & Locality	Condylobasal length	Zygomatic Breadth	Mastoid Breadth	Post orbital constriction	Maxillary tooth-row (entire)
P. hypomelas blanfordi					
87.4.2,2, ♀ Rohri (Sind) type ...	43.9	24.9	21.6	11.0	21.3
10.1.18, 28, ♂, Multan (Punjab) ...	44.3	25.0	22.4	11.0	21.3
10.1.18.29, ♀, Multan (Punjab) ...	42.2	24.5	21.5	11.2	21.2
15.11.1.57, ♂, Jacobabad (Sind) ...	47.6	26.2	23.2	11.5	23.3
15.11.1.58, ♂, Sukkur (Sind) ...	46.8	26.7	23.1	11.6	22.8
15.11.1.60, ♀, Sukkur (Sind) ...	46.0	26.1	23.0	11.2	22.3
15.11.1.61, ♂, Naundero (Sind) ...	45.5	26.7	22.6	11.7	22.1
23.11.3.25, ♂, Ara (Salt Range) Punjab ...	47.1	27.2	22.3	11.7	22.8
23.11.3.26, ♀, Ara (Salt Range) Punjab ...	48.3	28.9	23.8	11.4	23.0
23.11.3.28, ♀, Chakri (Salt Range) Punjab ...	44.9	27.3	23.0	11.4	22.1
87.1.14.1, ♀, Peshawar (N.W. Frontier Province) ...	49.1	29.0	23.5	11.8	23.9
87.1.14.2, ♀, Peshawar (N.W. F. Province) ...	49.3	26.2	23.7	11.9	23.0
Average ...	46.3	26.6	22.8	11.4	22.4

Family TALPIDAE

Genus *TALPA* Linnaeus, 1758.

Characters of *Talpa micrura:*

Feet modified for burrowing, palm everted, tail cylindrical and completely concealed by fur, upper incisors small and subequal, upper premolar small and distinctly spaced.

Dental formula: $i\ \frac{3-3}{3-3}$, $c\ \frac{1-1}{1-1}$, $pm\ \frac{4-4}{4-4}$, $m\ \frac{3-3}{3-3}$ = 44 teeth.

Talpa micrura micrura Hodgson, 1841. Eastern Mole.

1841. *Talpa micrurus* Hodgson, Calcutta J. N. H. 2: 221. Nepal, Central and Northern Hills. (Type Adult (?) B. M. No. 43.1.12.80).

REMARKS: There are specimens of this subspecies from Darjeeling (Bengal), Assam and Nepal in the B. M. Collection and had been reported by Blyth from Sylhet (Assam), now a part of East Pakistan.

Skull measurements (in mm.) of the specimens of *Talpa micrura* examined:

Brit Museum No., Sex & Locality	Condylobasal length	Zygomatic Breadth	Breadth Braincase	Greater Inter orbital Breadth	c-m³
T. micrura micrura					
9.7.4.1, ♀, ...	35.4	13.0	16.7	8.0	11.8
16.3.25.36, ♂, Darjeeling (Bengal) ...	31.7	11.9	...	7.7	10.7
16.3.25.38, ♂, Darjeeling (Bengal) ...	...	11.8	...	7.8	11.0
16.3.25.44, ♀, Darjeeling (Bengal)	33.0	...	15.5	7.9	11.2
16.3.25.45, ♀, Darjeeling (Bengal) ...	32.3	12.2	15.5	7.8	11.2
Average ...	33.1	12.2	15.9	7.8	11.1

Family SORICIDAE

KEY TO THE GENERA

1. Form adapted for terrestrial life; tail with noticeable sprinkling of elongated hairs.

   (*a*) Upper unicuspid teeth 4-4

   Dental formula: i $\frac{3-3}{1-1}$, c $\frac{1-1}{1-1}$, pm $\frac{2-2}{1-1}$, m $\frac{3-3}{3-3}$ = 30 teeth.

   .....*Suncus* Ehrenberg.

   (*b*) Upper unicuspid teeth 3-3.

   Dental formula: i $\frac{3-3}{1-1}$, c $\frac{1-1}{1-1}$, pm $\frac{1-1}{1-1}$, m $\frac{3-3}{3-3}$ = 28 teeth.

   .....*Crocidura* Wagler.

2. Form adapted for aquatic life; tail hairy with underside slightly fringed with white hairs.

   Dental formula : i $\frac{3-3}{2-2}$, c $\frac{1-1}{0}$, pm $\frac{1-1}{1-1}$, m $\frac{3-3}{3-3}$ =28 teeth.

   .....*Chimmarogale* Anderson.

Genus *SUNCUS* Ehrenberg, 1833.

KEY TO THE SPECIES

1. A larger form with hindfoot more than 18 mm.

   .....*murinus tytleri* Blyth.

2. A smaller form with hindfoot not more than 12 mm.

   .....*stoliczkanus subfulvus* Anderson

Suncus murinus tytleri Blyth, 1859. House Shrew.

1859. *Sorex tytleri* Blyth, J. Asiat, Soc. Bengal, 28: 285. Dehra Dun, Northern India (Type-Ind. Mus. Calcutta).

1877. *Crocidura* (*Pachyura*) *sindensis* Anderson, J. Asiat. Soc. Bengal, 46: 266. Karachi, Sind, India (Type-Ind. Mus. Calcutta).

Suncus stoliczkanus subfulrus Anderson, 1877. Anderson's Shrew.

1877. *Crocidura* (*Pachyura*) *subfulva* Anderson, J. Asiat. Soc. Bengal, 46: 278. Cutch, India (Type-Ind. Mus. Calcutta.)

REMARKS: Details of the specimens in the B. M. Collection of the above two species as well as the status of *S. m. sindensis* Anderson have been separately dealt with in a paper—"Notes on a collection of some shrews from West Pakistan and Kashmir".

Genus *CROCIDURA* Wagler, 1832

Crocidura russula pullata Miller, 1911. White-toothed Shrew.

1911. *Crocidura pullata* Miller, Proc. Biol. Soc. Washington, 24: 241. Kotihar, 7,000 ft., Kashmir (Type Adult and U. S. National Mus. No. 173, 213).

Crocidura attenuata kingiana Anderson, 1877. Grey Shrew.

1877. *Crocidura kingiana* Anderson, J. Asiat. Soc. Bengal, 46, 2: 281. Sikkim (Type-Ind. Mus. Calcutta).

Crocidura pergrisea pergrisea Miller, 1913. Pale Grey Shrew.

1913. *Crocidura pergrisea* Miller, Proc. Biol. Soc. Washington, 26: 113. Sokoro Lomba, Shigar, Baltistan, 9500 ft., Kashmir (Type Adult ♀ U. S. National Mus. No. 175918).

REMARKS: Details of the specimens of the above forms in the B. M. Collection and their identification have been separately dealt with in a Paper—"Notes on a Collection of some shrews from West Pakistan and Kashmir".

Crocidura pergrisea zarudnyi Ognev, 1928.

1928. *Crocidura zarudnyi* Ognev, Mamm. E. Europe, N. Asia, 1: 341 (Type not known).

COLLECTING CENTRES (No. of Specimens): Panjgur (1), Turbat (1), Kalat (1), all in Baluchistan (West Pakistan).

HABITAT: Tropical thorn forests.

Principal measurements (in mm.) of the specimens of *C. zarudnyi* examined:

Brit. Mus. No., Sex & Locality	Length H.& B.	Tail	Hind-foot	Condylo-basal length	Lachrymal Breadth	Breadth brain-case	Depth Brain-case	Mandible	Maxillary tooth-row (entire)	Mandibular tooth-row (entire)
C. pergrisea zarudnyi										
19.11.7.15, ♂, Panjgur (Baluchistan) ...	55	43	12	...	4.8	...	...	9.7	7.6	6.9
19.11.7.16, ♀, Turbat (Baluchistan) ...	53	43	12	...	...	...	...	...	...	...
19.11.8.3, ♀, Kalat (Baluchistan) ...	60	53	13	17.8	4.8	8.1	4.1	10.1	8.3	7.6
Average ...	56	46.3	12.3	12.3	4.8	8.1	4.1	9.9	7.9	7.2

Genus *CHIMMAROGALE* Anderson, 1877.

Characters of *Chimmarogale himalayica.*

Tail with a fringe of white hairs; ear-conch small and entirely concealed by the fur; feet scaly and toes naked.

Chimmarogale platycephala himalayica Gray, 1842. Himalayan Water Shrew.

1842. *Crossopus himalayicus* Gray, Ann. Mag. N. H. 10: 261. Chamba, North-eastern Punjab (Type B. M. No. 42.2.18.1). No skull except teeth.

REMARKS: According to Ellerman and Morrison-Scott (1951) its range includes Kashmir and Punjab. There are no specimens in the B. M. collection from the Western part of Punjab (West Pakistan) and Azad Kashmir, but there is possibility of this occurring in part of West Pakistan and Azad Kashmir.

Skull measurements (in mm). of the specimens of *C. himalayica* examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Lachrymal breadth	Maxillary tooth-row (entire)	Mandibular tooth-row (entire)
C. platycephala himalayica				
8.7.6.17, ♀, Liddar River (Kashmir) ...	26.0	6.7	12.2	11.2
20.6.6.5, ♀, Pangti (Naga Hills) ...	27.0	6.8	12.5	11.3
33.4.1.167, ♂, Chapa ...	26.1	6.6	12.5	11.3
90.1.1.4, (?) Sikkim ...	...	6.6	12.6	11.3
90.1.1.18, (?) Darjeeling ...	26.2	6.6	12.1	10.8
Average ...	26.3	6.6	12.4	11.2

Order CHIROPTERA

GENERAL CHARACTERS:

Mammals with their fore-limbs specially modified for flight. General plan of dentition: $i\frac{4}{6}$, $c\frac{1-1}{1-1}$, $pm.\frac{3-3}{3-3}$, $m.\frac{3-3}{3-3}=38$ teeth.

KEY TO THE SUBORDERS

1. Second finger separated from the third; its ungual phalanx present and generally terminating in a claw; crown of molars smooth and marked with a longitudinal furrow.
   .....MEGACHIROPTERA.
2. Second finger generally not separated from the third, its ungual phalanx absent and not terminating in a claw; crown of molars

acutely tubercular and marked by transverse furrows.
.....MICROCHIROPTERA.

Sub-order MEGACHIROPTERA.

Characters of family PTEROPIDAE:

Tragus and nose-leaf absent; well developed premaxillary, generally free and without palatal branch.

KEY TO THE GENERA

1. Tail short and distinct and in some partially included in the narrow interfemoral membrane; dorsal fur of one colour throughout.
   (*a*) Upper lip not grooved; first lower molar scarcely longer than the second; crowns of molars normal.

Dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, pm.$\frac{3-3}{3-3}$, m.$\frac{2-2}{3-3}$ =34 teeth.

.....*Rousettus* Gray.

   (*b*) Upper lip with a narrow vertical groove in the middle; crowns of molars longer than broad.

Dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, pm. $\frac{3-3}{3-3}$, m $\frac{1-1}{2-2}$ = 30 teeth.

.....*Cynopterus* F. Cuvier.

2. Tail absent; dorsal fur not of uniform colour, hind neck and shoulders paler than back; upper incisors separated from canine by wide diastema; lower incisors separated from each other and form the canines by small spaces.

Dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, pm $\frac{3-3}{3-3}$, m $\frac{2-2}{3-3}$ =34 teeth.

.....*Pteropus* Brisson.

Genus *ROUSETTUS* Gray, 1821.

KEY TO THE SPECIES

1. Pollex more than 30 mm. and the second phalanx of third digit more than 50 mm.....*arabicus* And. and de Winton.
2. Pollex less than 30 mm. and the second phalanx of third digit less than 50 mm.....*leschenaulti* Desm.

Rousettus arabicus Anderson and de Winton, 1902. Fruit Bat.

1902. *Rousettus arabicus* Anderson and de Winton, Zool. Egypt., Mamm. 86,88,89-90. Lahej, near Aden, Southern Arabia (Type—not Adult ♂, B. M. No. 95.6.1.47 by J. W. Yerbury; skin and skull-complete).

COLLECTING CENTRES (No. of Specimen): Panjgur (Baluchistan) (6) and Karachi (3) all in West Pakistan.

HABITAT: Tropical thorn forest.

REMARKS: The specimens of this species from Panjgur in the B. M. Collection extend its range to include Baluchistan in West Pakistan.

Rousettus leschenaulti leschenaulti Desmarest, 1820.

1820. *Pteropus leschenaulti* Desmarest, Encycl. Meth. Mamm. L: 110. Pondicherry, India (Cotypes—Paris Museum).

REMARKS: Specimens of this subspecies from Darjeeling (West Bengal) and Pagan (Burma) in the B. M. Collection indicate the likelihood of their inhabiting the northern areas of East Pakistan.

Principal Measurements (in mm.) of the Specimens of *Rousettus* spp. examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Pollex	2nd Phalanx of 3rd digit	Condylobasal length	Zygomatic width	c-m³
R. arabicus:						
19.11.7.2, ♂, Panjgur (Baluchistan) West Pakistan ...	88.1	32.5	56.4	38.2	24.8	16.4
19.11.7.3, ♂, Panjgur (Baluchistan) West Pakistan ...	87.6	31.9	57.3	37.4	24.6	16.3
19.11.7.4, ♀, Panjgur (Baluchistan) West Pakistan ...	82.1	31.3	52.5	35.9	23.8	15.0
20.1.17.1, ♂, Karachi (Sind) ...	89.1	31.8	56.6	...	...	16.2
20.1.17.2, ♂, Karachi (Sind) ...	88.3	33.2	54.5	36.6	24.4	16.3
Average ...	87.1	32.1	55.4	37.0	24.4	16.0
R. leschenaulti leschenaulti:						
14.7.19.7, ♂, Pagan, Burma ...	82.0	29.9	44.7	32.6	21.7	14.1
14.7.19.8, ♂, Pagan, Burma ...	81.6	26.4	45.0	...	...	...
14.7.19.11, ♀, Pagan, Burma ...	81.2	27.1	43.7	...	...	...
17.4.23.1, ♀, Pedong, Darjeeling (Bengal) ...	84.8	27.1	44.3	33.9	22.7	14.3
17.4.23.2, ♀, Pedong, Darjeeling (Bengal)	84.3	27.6	44.2	...	...	...
Average ...	82.7	27.6	44.3	33.2	22.2	14.2

Genus *PTEROPUS* Brisson, 1762.

Characters of *Pteropus giganteus giganteus:*

Rostrum slender; dorsal fur darker than ventral, tibia naked above; teeth small, posterior basal ledges of premolars practically obliterated.

Pteropus giganteus giganteus Brunnich, 1782. Indian Flying Fox.

1782. *Vespertilio gigantea* Brunnich, Dyrenes Historie, 1: 45. Bengal, India (Type in Copenhagen Museum).

1870. *Pteropus kelaarti Gray*, Cat. Monkeys, Lemurs and Fruit-eating Bats, B. M. 104. Ceylon (Cotypes Adults (?) B. M. No. 48.12.22.1 and 2 by Capt. Stevens: skins and skulls complete except for 2-skin none).

COLLECTING CENTRE (No. of Specimen): Shamgung (Mymensingh district), East Pakistan (1) collected by Zoological Survey of Pakistan.

HABITAT: Tropical evergreen forests.

REMARKS: There is no specimen of this subspecies from East Pakistan in the B. M. collection, but the collection from Mymensingh district, East Pakistan by the Zoological Survey of Pakistan, and the B. M. Collection from Jalpaiguri, Midnapore and Shillong (Assam) extend its range to include the whole of Bengal including East Pakistan. Ellerman and Morrison-Scott (1915) mentioned its range up to Bhutan Duars (West Bengal) and Pegu (Burma).

Principal measurements (in mm.) of the specimens of *Pteropus giganteus giganteus* examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Pollex	Condylo-basal length	Zygomatic width length	c-m³
15.4.3.5, ♀, Salbani, Midnapore (Bengal) ...	148.9	66.0	59.1	33.9	24.8
15.9.1.7, ♂, Jalpaiguri (Bengal) ...	168.0	66.9	...	...	...
15.9.1.8, ♂, Jalpaiguri (Bengal) ...	165.4	67.9	...	...	...
15.9.1.9, ♀, Jalpaiguri (Bengal) ...	173.1	66.2	63.8	38.7	25.6
15.9.1.10, ♀, Jalpaiguri (Bengal) ...	155.7	65.6	63.3	37.5	26.8
34.7.2.49, ♂, Shillong (Assam) ...	175.1	65.3	...	...	...
34.7.2.50, ♀, Shillong (Assam) ...	161.0	59.4	...	...	...
Z.S.P. (*a*), ♂, Shamgunj (Mymensingh district), East Pakistan ...	149.2	64.0	...	...	...
Average ...	162.0	65.0	62.1	36.7	25.7

Genus *CYNOPTERUS* F. Cuvier, 1824.

Characters of *Cynopterus sphinx:*

Cheek-teeth narrower than broad and oval in outline.

Cynopterus sphinx sphinx Vahl, 1797. Short-nosed Fruit Bat.

1797. *Vespertilio sphinx* Vahl. Skr. Nat. Selsk Copenhagen, 4, 1: 123. Tranquebar, Madras, India (Type-unknown).

REMARKS: Specimens of this subspecies, from Bhutan Duars and Darjeeling (Bengal) and Pagan (Burma) in the B. M. Collection, indicate the possibility of its occurring in East Pakistan. Ellerman and Morrison-Scott (1951) has included Sylhet (East Pakistan) in its range.

Principal measurements (in mm.) of the specimens of *Cynopterus s. sphinx* examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Pollex	2nd Phalanx of 3rd digit	Condylobasal length	Zygomatic width	c-m³
14.7.19.15, ♂, Pagan, Burma ...	71.0	28.8	42.6	30.0	20.6	11.6
14.7.19.16, ♀, Pagan, Burma ...	69.7	25.4	40.5	28.1	19.4	10.7
16.3.25.1, ♀, Darjeeling, West Bengal	61.0	26.4	38.5	...	...	...
16.3.25.2, ♂, Darjeeling, West Bengal...	69.2	28.0	39.8	...	...	10.9
16.7.19.5, ♂, Bhutan Duars, West Bengal ...	72.2	28.1	40.5	...	...	...
16.7.19.6, ♀, Bhutan Duars, West Bengal ...	71.3	27.6	40.2	30.4	19.5	10.8
Average ...	69.0	27.4	40.4	29.5	19.8	11.0

Sub-order MICROCHIROPTERA.

CHARACTERS:

Tragus normally present (absent in Rhinolophidae and Hipposideridae).

Family RHINOPOMATIDAE

Characters of genus *Rhinopoma :*

Tail long and thin, emerging from the end of the interfemoral membrane; antitragus separated from outer margin of ear by a notch; skull without post-orbital processes.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, $pm.\frac{1-1}{2-2}$, $m.\frac{3-3}{3-3}=28$ teeth.

Genus *RHINOPOMA* Geoffroy, 1818.

KEY TO THE SPECIES

1. Tail shorter than fore-arm; presence of transverse ridge in skull above the nostrils.....*microphyllum* Brunnich.
2. Tail longer than fore-arm; presence of a globular swelling in skull above the nostrils.....*hardwickei* Gray.

Rhinopoma microphyllum Brunnich, 1782. Larger Rat-tailed Bat.

1782. *Vespertilio microphyllus* Brunnion, Dyrenes Hist. 1: 50, Pl. 6., figs. 1-4. Arabia and Egypt.

1912. *Rhinopoma kinneari* Wroughton, J. Bombay N. H. Soc. 21, 3: 767. Bhuj, Cutch, India (Type adult ♂ B. M. No. 11.12.11.1 by Crump; skin and skull-complete).

REMARKS: Status of *R. kinneari* and the details of specimens of *R. microphyllum* and *R. kinneari* in the B. M. Collection have been described in a separate paper—'Notes on some bats of the Oriental Region'.

Rhinopoma hardwickei hardwickei Gray, 1831. Lesser Rat-tailed Bat.

1831. *Rhinopoma hardwickei* Gray, Zool. Misc. 37, India (Type Adult ♂ B. M. No. *i.e.* by General Hardwicke, Alcohol specimen).

COLLECTING CENTRES (No. of Specimen): Amb (4), Ara (2), and Rohtas (2)—Salt Range; Landhi (Karachi) (2), all in West Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

REMARKS: This Palaearctic species is well established in the Oriental Region in the Indo-Pakistan subcontinent.

Principal measurements (in mm.) of the specimens of *R. h. hardwickei* examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
i.e., ♂, India *Type* ...	60.6	16.5	11.1	6.2
15.11.1.48, ♂, Landhi (Karachi), West Pakistan ...	63.1	16.9	...	6.2
15.11.1.49, ♀, Landhi (Karachi), West Pakistan ...	58.8	15.7	10.2	6.1
23.11.3.7, ♂, Amb (Salt Range), West Pakistan ...	61.8	16.2	10.9	6.3
23.11.3.8, ♂, Amb (Salt Range), West Pakistan ...	58.1	16.3	103	6.2

(*Continued*)

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m^3
23.11.3.9, ♀, Amb (Salt Range), West Pakistan ...	59.6	16.1	10.6	6.1
23.11.3.10, ♀, Amb (Salt Range), West Pakistan ...	60.3	15.4	10.0	6.0
23.11.3.11, ♀, Rohtas (Salt Range), West Pakistan ...	61.3	16.3	...	6.2
23.11.3.12, ♀, Rohtas (Salt Range), West Pakistan ...	60.9	16.0	...	6.0
26.9.2.4, ♂, Ara (Salt Range), West Pakistan ...	60.7	...	...	...
26.9.2.5, ♂, Ara, (Salt Range), West Pakistan ...	60.7	16.2	10.6	6.2
Average ...	60.5	16.2	10.5	6.2

Family EMBALLONURIDAE

Characters of the genus *Taphozous* :

Nose-leaf absent and tragus present; tail short and thick, emerging from the upper-surface of the interfemoral membrane; skull with long and curved post-orbital processes.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, $pm.\frac{2-2}{2-2}$, $m.\frac{3-3}{3-3}$=30 teeth.

Genus *TAPHOZOUS* Geoffroy, 1818.

KEY TO THE SPECIES

Sub-genus *Taphozous* Geoffroy, 1818.

Taphozous perforatus perforatus E. Geoffroy, 1818. Tomb Bat.

1818. *Taphozous perforatus* Geoffroy, Description de l'Egypte, 2: 126. Egypt (Type—unknown).

COLLECTING CENTRE (No. of specimens): Jatti (Thatta district) West Pakistan (10)—collected Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: There are no specimens of this species from West Pakistan in the B. M. Collection. The collection made by Zoological Survey of Pakistan from Thatta district (Sind) extends the range from Cutch and Kathiawar to this area in West Pakistan.

Taphozous longimanus longimanus Hardwicke, 1825.

1825. *Taphozous longimanus* Hardwicke, Trans. Linn. Soc. London, 14: 525. Calcutta, Bengal, India (Type—not known).

REMARKS: There are specimens of this species from different parts of Bengal and Assam in the B. M. collection, but there is none from East Pakistan, from whence collection should be made.

Subgenus *Liponycteris* Thomas, 1922.

Taphozous kachhensis kachhensis Dobson, 1872. Naked-bellied Tomb Bat.

1872. *Taphozous kachhensis* Dobson, J. Asiat. Soc. Bengal, 41, 2: 221. Gutch, India (Type Adult ♀, B. M. No. 9.1.4.42 by Stoliczka, skin (alcohol), skull-base slightly broken).

COLLECTING CENTRES (No. of Specimen): Rohats (Salt Range) (6), Kashmor (Sind) (3), Kotdiji (Khairpur) (3); Tori (Jacobabad district Sind) (4)—collected by Zoological survey of Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

REMARKS: Specimens of this sub-species from Salt Range (Punjab) in the B. M. collection extend its range from Sind to Punjab in West Pakistan. Ellerman and Morrison-Scott (1951) did not note this extension. There are no specimens from East Pakistan in the collection, although specimens from other areas of Bengal are present.

Subgenus *Saccolaimus* Lesson, 1842.

Taphozous saccolaimus crassus Blyth, 1844. Pouch-bearing Bat.

1844. *Taphozous crassus* Blyth, J. Asiat. Soc. Bengal, 13: 491. Mirzapore, Allahabad, United Provinces, India (Type—not known).

REMARKS: Ellerman and Morrison-Scott (1951) gave the range of this Sub-species from "Ceylon, Peninsula of India to Bengal, perhaps Burma", in the checklist but there are no specimens from Bengal in the B. M. collection.

Principal measurements (in mm.) of the specimens of *Taphozous* species examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
T. perforatus perforatus				
12.10.4.5, ♂, Bhuj, Cutch, India ...	60.4	18.2	11.5	8.2
12.10.4.7, ♂, Bhuj, Cutch, India ...	60.3	18.4	11.8	8.4

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
T. perforatus perforatus				
12.10.4.16, ♀, Bhuj, Cutch, India ...	61.4	18.2	11.6	8.3
13.8.8.6, ♀, Rajkot, Kathiawar, India	62.6	18.0	11.7	8.4
13.8.8.7, ♀, Rajkot, Kathiawar, India	61.5	17.7	...	8.1
Z.S.P. 34, ♂, Jatti (Thatta district), West Pakistan ...	61.5	...	...	...
Z.S.P. 34/1, ♂, Jatti (Thatta district), West Pakistan ...	62.4	18.7	11.8	8.6
Z.S.P. 34/2, ♀, Jatti (Thatta district), West Pakistan ...	61.9	...	...	...
Z.S.P. 34/3, ♂, Jatti (Thatta district), West Pakistan ...	63.6	18.4	11.5	8.6
Z.S.P. 34/4, ♂, Jatti (Thatta district), West Pakistan ...	62.1	...	...	...
Z.S.P. 34/5, ♀, Jatti (Thatta district), West Pakistan ...	64.9	18.7	...	8.6
Z.S.P. 34/6, ♂, Jatti (Thatta district) West Pakistan ...	63.8	...	...	...
Z.S.P. 34/7, (?), Imm., Jatti (Thatta district), West Pakistan ...	51.0	...	...	...
Z.S.P. 34/8 ♀, Jatti (Thatta district), West Pakistan ...	63.0	18.6	11.6	8.6
Z.S.P. 34/9, ♂, Jatti (Thatta district), West Pakistan ...	63.4	18.7	11.8	8.6
Average ...	62.3	18.4	11.7	8.4
T. longimanus longimanus				
12.11.29.66, ♂, Chanda, India ...	57.4	19.2	12.5	8.5
12.11.29.71, ♀, Chanda, India ...	58.2	18.7	12.5	8.8
14.7.19.52, ♂, Pagan, Burma ...	59.1	19.3	13.0	9.1
15.4.3.53, ♂, Salabani, Bengal, India ...	...	18.7	12.5	8.4
15.4.3.54, ♀, Midnapore, Bengal, India	58.5	18.9	12.8	8.9
98.5.7.6, ♂, Surat, Gujerat, India ...	...	18.5	12.4	8.4
Average ...	58.3	18.9	12.6	8.7

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
T. kachhensis kachhensis				
9.1.4.42, ♀, Cutch, India...Type ...	73.0	22.5	15.7	11.2
15.9.1.41, ♀, Sivok, Bengal, India ...	71.7	22.8	15.5	10.8
15.9.1.40, ♂, Sivok, Bengal, India ...	76.9	22.9	15.8	11.1
15.11.1.38, ♂, Kashmor (Jacobabad district) West Pakistan ...	72.2	22.3 ...	15.6	10.7
15.11.1.40, ♀, Kot Diji, Khairpur State, West Pakistan ...	72.3	22.8	15.6	10.8
23.11.3.13, ♂, Rohtas, Salt Range (Punjab), West Pakistan ...	72.2	22.9	...	10.9
23.11.3.15, ♀, Rohtas, Salt Range (Punjab), West Pakistan ...	70.7	21.6	15.0	10.1
23.11.3.17, ♀, Rohtas, Salt Range (Punjab), West Pakistan ...	70.4	21.3	...	10.3
Z. S. P. 28, ♂, Tori (Jacobabad district), West Pakistan ...	71.8	23.0	...	10.7
Z. S. P. 28/4, ♂, Tori (Jacobabad district), West Pakistan ...	73.3	22.9	15.9	11.0
Z. S. P. 28/7, ♂, Tori (Jacobabad district), West Pakistan ...	73.8	22.8	16.0	11.0
Z. S. P. 28/13, ♂, Tori (Jacobabad district) , West Pakistan ...	69.7	22.7	...	10.8
Average ...	72.3	22.5	15.6	10.8

Family MEGADERMATIDAE

Character of genus *MEGADERMA:*

Bifid tragus and long, erect noseleaf present; tail very short in the base of the interfemoral membrane.

Dental formula: $i\frac{0-0}{2-2}$, $c\frac{1-1}{1-1}$, $pm\frac{2-2}{2-2}$, $m\frac{3-3}{3-3}$=28 teeth.

Genus *MEGADERMA* E. Geoffroy, 1810.

Sub-genus *LYRODERMA* Peters, 1872

Character of *Megaderma lyra lyra*

Nose-leaf rounded in front having a notch on each side behind the nostrils, thus truncating the posterior end,

Megaderma lyra lyra Geoffroy, 1810. Indian False Vampire.

1810. *Megaderma lyra* E. Geoffroy, Ann. Mus. H. N. Paris, 15: 190. India (? East coast, Madras). Type-unknown.

COLLECTING CENTRES (No. of Specimen): Lehtrar (Murree), Punjab (6) and Baluchistan (1), West Pakistan.

HABITAT: Subtropical dry evergreen forests.

REMARKS: Specimens of this subspecies, from Murree (Punjab) and Baluchistan in the B. M. Collection, establish its presence in these areas in West Pakistan.

Principal measurements (in mm.) of the specimens of *Megaderma lyra lyra* examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
23.11.4.2, ♂, Lehtrar (Murree) West Pakistan ...	64.5	25.4	...	11.2
23.11.4.3, ♂, Lehtrar (Murree), West Pakistan ...	64.8	25.1	...	11.2
23.11.4.4, ♂, Lehtrar (Murree), West Pakistan ...	...	25.2	...	11.2
23.11.4.5, ♀, Lehtrar (Murree), West Pakistan ...	67.8	25.5	...	11.4
23.11.4.6, ♀, Lehtrar (Murree), West Pakistan ...	69.2	25.5	...	11.2
23.11.4.7, ♀, Lehtrar (Murree) West Pakistan ...	68.2	...	...	...
69.8.24.5 (?), Baluchistan, West Pakistan ...	...	23.3	...	10.3
Average ...	66.9	25.0	...	11.1

Family RHINOLOPHIDAE

Sub-family Rhinolophinae

Characters of genus *Rhinolophus:*

A well-developed nose-leaf present; ear with large leaf-like antitragus, separated by a notch from the outer margin of the ear; first toe with two and remaining toes with three joints each.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, pm.$\frac{2-2}{3-3}$, m.$\frac{3-3}{3-3}$=32 teeth.

Genus *RHINOLOPHUS* Lacepede, 1799.

KEY TO THE SPECIES

1. Connecting process of nose-leaf high and prominent, starting at top of the sella; second upper premolar separated from canine by a wide space in the centre of which the first premolar is placed .....*lepidus* Blyth.

2. Connecting process of noseleaf low and not tapering upwards; second upper premolar close to canine, the first premolar is either external to the tooth-row or placed in between canine and second premolar. .....*ferrumequinum* Schreber.

Rhinolophus ferrumequinum tragatus Hodgson, 1835. Greater Horse-Shoe Bat.

1835. *Rhinolophus tragatus* Hodgson, J. Asiat. Soc. Bengal 4: 699. Nepal (Lectotype Adult ♀, B. M. No. 43.1.12.135; skin-alcohol, skull-complete; cotypes B. M. Nos. 43.1.12.136-137).

COLLECTING CENTRES (No. of Specimen): Simla (1), Manali, Kullu Valley, East Punjab (8); Naga Hills, Assam (2).

HABITAT: Sub-tropical dry evergreen and tropical evergreen forests.

REMARKS: Specimens of this subspecies from Simla, Kullu Valley (Punjab) and Naga Hills (Assam) in the B. M. Collection, establish its range to include these areas. Ellerman and Morrison-Scott (1951) did not mention this in the checklist. There is also a possibility that this subspecies occurs in part of Punjab now included in West Pakistan.

Rhinolophus ferrumequinum proximus Andersen, 1905.

1905. *Rhinolophus ferrumequinum proximus* Andersen, P.Z.S. 1905, 2: 112. Gilgit, Kashmir (Type Adult (?) B. M. No. 81.3.1.10-in alcohol).

COLLECTING CENTRE (No. of Specimen): Gilgit, Azad Kashmir (1).

HABITAT: Dry temperate forests.

Rhinolophus lepidus lepidus Blyth, 1844.

1844. *Rhinolophus lepidus* Blyth, J. Asiat. Soc. Bengal, 13: 486. Calcutta (Type—not known).

REMARKS: According to Ellerman and Morrison-Scott (1951) the range of this subspecies includes Bengal but there is no specimen from East Pakistan in the B. M. Collection.

Principal measurements (in mm.) of the specimens of *Rhinolophus* species examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
R. ferrumequinum tragatus				
13.10.26.1, ♂, Simla, East Punjab ...	59.2	19.7	11.8	8.9
23.9.1.3, ♀, Manali (Kullu Valley), East Punjab ...	58.4	21.2	...	9.1
23.9.1.4, ♀, Manali (Kullu Valley), East Punjab ...	54.2	19.6	...	8.9
23.9.1.5, ♀, Manali (Kullu Valley), East Punjab ...	56.8	19.8	...	9.0
23.9.1.6, ♀, Manali (Kullu Valley), East Punjab ...	57.8	20.5	...	9.2
23.9.1.7, ♀, Manali (Kullu Valley), East Punjab ...	56.8	...	...	...
23.9.1.8, ♀, Manali (Kullu Valley), East Punjab ...	57.8	...	...	...
23.9.1.9, ♀, Manali (Kullu Valley), East Punjab ...	57.5	...	...	...
Average ...	57.3	20.2	11.8	9.0
R. ferrumequinum proximus				
81.3.1.10, ♀, Gilgit, Azad Kashmir—Type ...	54.7	18.8	11.0	8.6
R. lepidus lepidus ...				
21.1.17.15, ♂, Gaya, Bihar, India ...	39.6	14.5	7.8	6.3
21.1.17.18, ♀, Midnapore, Bengal, India ...	38.3	14.5	8.2	6.1
21.1.17.19, ♀, Midnapore, Bengal, India ...	39.6	14.6	7.9	6.2
21.1.17.20, ♀, Madnapore, Bengal, India ...	40.2	14.3	7.9	6.1
Average ...	39.4	14.4	7.9	6.1

Sub-family Hipposiderinae

KEY TO THE GENERA

1. Anterior portion of nose-leaf not divided in the middle: Lower incisors form a continuous row between canines.

   (*a*) Distinction between fused phalanges of third, fourth and fifth

toes not present; skull with distinct but not specially developed sagittal crest.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, $pm\frac{2-2}{2-2}$, $m\frac{3-3}{3-3}$=30 teeth.

.....*Hipposideros* Gray.

(*b*) Distinction between fused phalanges of third, fourth and fifth toes persist; conspicuous knife-like sagittal crest in the inter-orbital region of skull.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, $pm\frac{1-1}{2-2}$, $m\frac{3-3}{3-3}$=28 teeth.

.....*Asellia* Gray.

2. Anterior portion of nose-leaf divided into distinct lappets; lower incisors not forming a continuous row between canines. Index finger very long; metacarpal bone of thumb very long, phalanx short.

Dental formula: $i\frac{1-1}{2-2}$, $c\frac{1-1}{1-1}$, $pm\frac{2-2}{2-2}$, $m\frac{3-3}{3-3}$=30 teeth.

.....*Coelops* Blyth.

Genus *HIPPOSIDEROS* Gray, 1831.

KEY TO THE SPECIES

1. Size large with canine-molar length not less than 6 mm. .....*bicolor* Temminck.
2. Size smaller with canine-molar length not more than 6 mm. .....*cineraceus* Blyth.

Hipposideros* (?) *bicolor pallidus Andermen, 1918. Bicoloured Leaf-nosed Bat.

1918. *Hipposideros fulvus pallidus* Andersen, Ann. Mag. N. H. 2: 381. Junagadh, Kathiawar, India (Type, Adult ♂, B. M. No. 18.8.3.5; skin and skull-complete).

COLLECTING CENTRES (No. of Specimens): Chaklala (Rawalpindi) (2); Sukkur (6); Gholam (Sind) (4); Baluchistan (1); Shujawal (Thatta district) (2) collected by Zoological Survey of Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

REMARKS: Specimens of this subspecies from Punjab and Baluchistan in the B. M. Collection extend its range to these areas in West Pakistan.

Hipposideros cineraceus cineraceus Blyth, 1853.

1853. *Hipposideros cineraceus* Blyth, J. Asiat. Soc. Bengal, 22: 410. Near Pind Dadan Khan, Salt Range, Punjab (Type—not known).

REMARKS: There is no specimen from Punjab (West Pakistan) but the specimens from Darjeeling establish its presence in Bengal.

Principal measurements (in mm.) of the specimens of *Hipposideros* species examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
H. (?) bicolor pallidus.				
19.11.7.14, ♂, Baluchistan, West Pakistan ...	38.9	...	...	...
21.1.17.130, ♂, Sukkur (Sind), West Pakistan ...	39.6	14.5	8.4	6.3
21.1.17.131, ♂, Sukkur (Sind), West Pakistan ...	38.8	...	7.9	6.2
21.1.17.132, ♀, Sukkur (Sind), West Pakistan ...	41.0	14.8	8.1	6.0
21.117.133, ♀, Sukkur (Sind), West Pakistan ...	39.2	...	8.1	6.1
21.1.17.134, ♀, Sukkur (Sind), West Pakistan ...	41.1	14.8	...	6.3
26.9.2.2, ♀, Chaklala (Rawalpindi), West Pakistan ...	42.2	...	...	...
Z.S.P. (*b*), ♀, Shujawal (Thatta District), West Pakistan ...	40.0	...	...	6.3
Z.S.P. (*c*), ♂, Shujawal, (Thatta District), West Pakistan ...	40.8	...	...	...
Average ...	42.4	14.7	8.1	6.2
H. cineraceus cineraceus				
21.1.17.33, ♂, Darjeeling, Bengal ...	35.2	13.1	6.4	5.0
21.1.17.36, ♀, Darjeeling, Bengal ...	33.7	12.8	5.9	5.0
21.1.17.37, ♀, Darjeeling, Bengal ...	35.7	12.9	6.2	5.1
21.1.17.39, ♀, Darjeeling, Bengal ...	35.4	...	...	...
25.6.10.1, ♀, Hissar (East Punjab) ...	40.0	...	...	...
Average ...	36.0	12.9	6.1	5.0

Genus *ASELLIA* Gray, 1838.

Characters of *Asellia tridens*:

Posterior margin of noseleaf terminating in three sharp points.

Asellia tridens murraina J. Anderson, 1881. Trident Leafnosed Bat.

1881. *Phyllorhina tridens var. murraiana* Anderson, Cat. Mamm. Ind. Mus. 113.

Karachi, Sind, Western India (Type—Ind. Mus. Calcutta No. 121 hh).

COLLECTING CENTRES (No. of Specimens): Makran Coast (1), Panjgur, Baluchistan (4), Nawab Issa Khan's Tomb, Thatta (Sind) (1)—all in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: Specimens of this subspecies from Panjgur and Makran cost (Baluchistan) in the B. M. Collection extend its range to include this area of West Pakistan.

Genus *COELOPS* Blyth.

Geolops frithi frithi Blyth, 1848. Tailless Leaf-nosed Bat.

1848. *Coelops frithii* Blyth, J. Asiat. Soc. Bengal, 17: 251. Sunderbans, Bengal, India (Type-Ind. Mus. Calcutta No. 132a).

REMARKS: There is no specimen of this subspecies from Sundarbans, Bengal (Part of East Pakistan) in the B. M. Collection.

Principal measurements (in mm.) of the specimens of *Asellia* sp. and *Coelops* sp. examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m^3
A. tridens murraiana				
19.11.7.7, ♀, Panjgur Baluchistan, West Pakistan ...	51.4	...	9.4	6.8
19.11.7.8, ♀, Panjgur Baluchistan, West Pakistan ...	51.1	15.9	9.9	6.8
19.11.7.9, ♀, Panjgur Baluchistan, West Pakistan ...	50.6	15.9	9.9	6.9
19.11.7.10, ♀, Panjgur Baluchistan, West Pakistan ...	51.7	15.8	9.8	6.8
25.7.3.1, ♂, Nawab Issa Khan's Tomb, Thatta, West Pakistan ...	54.0	16.3	10.0	7.2
85.8.1.368, (?) Makran coast, West Pakistan ...	51.2	...	...	7.0
Average ...	51.6	15.9	9.8	6.9
C. frithi frithi				
20.11.1.23, ♂, Assam ...	42.0	13.4	7.5	6.0

Family MOLLOSIDAE

Characters of genus *TADARIDA:*

Tail short and stout, emerging from the end of interfemoral membrane; tragus present and noseleaf absent; ears large, rounded and arise from the same point on forehead; upper lip wrinkled; canine cingulum, distinct.

Dental formula: $i\frac{1-1}{2-2}$, $c.\frac{1-1}{1-1}$, $pm.\frac{2-2}{2-2}$, $m.\frac{3-3}{3-3}=30$ teeth.

Genus *TADARIDA* Refinesque, 1814.

KEY TO THE SPECIES

1. Size large with fore-arm more than 50 mm.
   .....*aegyptiaca sindica* Wroughton.
2. Size smaller with fore-arm not more than 50 mm.
   .....*aegyptiaca thomasi* Wroughton

Tadarida aegyptiaca sindica Wroughton, 1919. Free-tailed Bat.

1919. *Tadarida sindica* Wroughton, J. Bombay N. H. Soc. 26: 732. Kashmor, upper Sind Frontier, India (Type adult ♀ B. M. No. 15.11.1.51; skin and skull-complete).

COLLECTING CENTRES (No. of Specimens): Kashmor (Upper Sind Frontier) (1), Tori (Jacobabad district) West Pakistan (9) collected by Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

Tadarida aegyptiaca thomasi Wroughton, 1919.

191. *Tadarida thomasi* Wroughton, J. Bombay, N. H. Soc. 26: 732. Bhuj, Cutch, India (Type Adult ♀ B. M. Bo. 12.10.4.32; skin and skull-complete).

COLLECTING CENTRES (No. of Specimens): Bubak (Dadu district), West Pakistan (9), collected by Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: Specimens of this subspecies from Kathiawar, Cutch and Ceylon are present in the B. M. Collection but there are none from Pakistan. The collection of nine specimens from Dadu district (Sind) by the Zoological Survey of Pakistan, enable its range to be extended to this area in West Pakistan.

Principal measurements (in mm.) of the specimens of *Tadarida* spp. examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
T. aegyptiaca sindica				
15.11.1.51, ♀, Kashmor (Jacobabad district), West Pakistan-Type ...	51.9	19.7	13.0	7.8
15.11.1.50, ♂, Kashmor (Jacobabad district), West Pakistan ...	51.5	19.5	13.2	7.6
Z.S.P. 28/1, ♂, (Jacobabad district), West Pakistan ...	51.5	19.0	12.8	7.7
Z.S.P. 28/5, ♂, Tori, (Jacobabad district), West Pakistan ...	50.7	18.8	12.4	7.6
Z.S.P. 28/6, ♂, Tori (Jacobabad district), West Pakistan ...	52.0	...	...	...
Z.S.P. 28/8, ♂, Tori (Jacobabad district), West Pakistan ...	53.6	...	...	...
Z.S.P. 28/9, ♀, Tori (Jacobabad district), West Pakistan ...	51.2	...	12.4	7.6
Z.S.P. 28/10, ♂, Tori (Jacobabad district), West Pakistan ...	50.1	...	...	...
Z.S.P. 28/11, ♂, Tori (Jacobabad district), West Pakistan ...	52.4	19.3	12.7	7.8
Average ...	51.7	19.3	12.8	7.7
T. aegyptiaca thomasi				
12.10.4.32, ♀, Bhuj, Cutch, India-Type ...	48.7	17.3	11.5	7.2
12.10.4.30, ♂, Bhuj, Cutch, India ...	46.7	...	11.4	7.5
12.10.4.33, ♀, Bhuj Cutch, India ...	47.8	17.3	11.4	7.3
13.8.6.25, ♂, Vankavcer, Kathiawar, India ...	46.6	18.7	11.5	7.3
31.9.4.1, ♀, Muskande Gammaduwa, Ceylon ...	...	18.2	11.4	7.2
Z. S. P. 3, ♂, Bubak (Dadu district), West Pakistan ...	46.0	...	...	...
Z. S. P. 16/9, ♀, Bubak (Dadu district), West Pakistan ...	49.6	18.5	11.6	7.3
Z. S. P. 16/12, ♂, Bubak (Dadu district), West Pakistan) ...	47.5	...	...	...

Brit. Mus. No.,Sex and Locality	Fore-arm	Condylobasal length	Zygomatic width	c-m³
Z. S. P. 16/13, ♂, Bubak (Dadu district), West Pakistan ...	47.1	...	...	...
Z. S. P. 16/14, ♂, Bubak (Dadu district), West Pakistan ...	49.8	18.7	11.6	7.4
Z. S. P. 22, ♂, Bubak (Dadu district), West Pakistan ...	49.7	18.3	11.6	7.2
Z. S. P. 22/2, ♂, Bubak (Dadu district) West Pakistan ...	48.4	18.7	11.4	7.5
Z. S. P. 22/4, ♂, Bubak, (Dadu district), West Pakistan ...	47.2	...	...	...
Z. S. P. 22/5, ♀, Bubak, (Dadu district), West Pakistan ...	48.4	18.2	11.6	7.1
Average ...	48.0	18.2	11.5	7.3

Family VESPERTILIONIDAE

Sub-Family Vespertilioninae

Characters: Nostrils neither elongated nor tubular; second phalanx of third finger not elongated; cheek-teeth less than six on each side in the upper and lower jaws.

KEY TO THE GENERA

(*a*) Two premolars on each side in upper jaw.

(*b*) Three premolars on each side in lower jaw.
(Nostrils not overhung by glandular outgrowths from side of muzzle).

Dental formula: $i\frac{2-2}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{2-2}{3-3}$, $m.\frac{3-3}{3-3}$=36 teeth.

.....*Plecotus* Geoffroy.

(*b*1) Two premolars on each side in lower jaw.

(*c*) Outer upper incisor normal in position and its concavity directed backwards.

Dental formula: $i\frac{2-2}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{2-2}{2-2}$, $m.\frac{3-3}{3-3}$=34 teeth.

.....*Pipistrellus* Kaup.

(*a*1) One premolar on each side in upper jaw.

(*c*1) Outer upper incisor small, placed on outer side of inner incisor and separated from canine.

(*d*) Two incisors on each side in upper jaw.

Dental formula: $i\frac{2-2}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{1-1}{2-2}$, $m.\frac{3-3}{3-3}$=34 teeth.

.....*Eptesicus* Rafinesque.

(*d*1) One incisor on each side in upper jaw.

(*e*) Ears large, auditory bullae much wider than the space between them.

Dental formula: $i\frac{1-1}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{1-1}{2-2}$, $m.\frac{3-3}{3-3}$=30 teeth.

.....*Otonycteris* Peters.

(*e*1) Ears not large, auditory bullae not as wide as the space between them.

(*f*) First and second upper molars with W pattern distorted or nearly absent; first and second lower molars with second triangle smaller than first.

Dental formula: $i\frac{1-1}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{1-1}{2-2}$, $m.\frac{3-3}{3-3}$=30 teeth.

.....*Scotophilus* Leach.

Eptesicus serotinus pachyomus Tomes, 1857. Serotine.

1857. *Scotophilus pachyomus* Tomes, P.Z.S. 50. Rajputana, India (Type Adult, (?) B. M. No. 48.2.18.7.; skin and skull (in specimen) complete).

COLLECTING CENTRES (No. of Specimens): Pahlgam (Kashmir) (2) and Kashmir (1).

HABITAT: Dry temperature forests.

Eptesicus nilssoni nilssoni Keyserling and Blasius, 1839. Northern Bat.

1839. *Vespertilio nilssonii* Keyserling and Blasius, Arch. Naturgesch 5, 1: 315. Sweden. (Type—not known).

REMARKS: Ellerman and Morrison-Scott (1951) include Gilgit (Azad Kashmir) in its range but give no reference and there is no specimen from Kashmir in the B. M. Collection.

Principal measurements (in mm.) of the specimens of *Eptesicus* species examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
E. nasutus nasutus				
19.11.7.13, ♀, Junction of Raghai and Sichk rivers in Kharan State, West Pakistan ...	37.2	...	...	...
E. isabellinus bottae				
8.12.12.1, ♂, Astor, Kashmir (Azad Kashmir) ...	42.2	14.6	9.9	5.7
E. serotinus pachyomus				
3.9.29.1, ♂, Kashmir ...	48.9	19.1	12.7	7.1
8.7.6.5, ♀, Pahlgam, Kashmir ...	49.6	18.5	12.2	7.5
8.7.6.6, ♀, Pahlgam, Kashmir ...	50.1	...	...	7.4
Average ...	49.5	18.8	12.4	7.3

Genus *PIPISTRELLUS* Kaup, 1829.

KEY TO THE SPECIES

A. Size large, fore-arm about 40 mm.:
Tragus narrow and rounded at tip.
Skull larger and stouter and anterior premolar larger.
(*i*) Colour pale brown.....*ceylonicus chrysothrix* Wroughton.

(*f*1) First and second upper molars with W pattern not distorted, and second lower molars with second triangle larger first than first.

(*g*) Third lower incisor as large as first or second; (depth of maxillary emargination equal to distance between canines).

Dental formula: $i\frac{1-1}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{1-1}{2-2}$, $m.\frac{3-3}{3-3}$ = 30 teeth.

.....*Nycticeius* Refinesque.

Genus *EPTESICUS* Rafinesque, 1820.

KEY TO THE SPECIES

1. Size large with fore-arm between 49-55 mm.
..... *serotinus pachyomus* Tomes.

2. Size smaller,

(*a*) fore-arm 40 mm. .....*isabellinus bottae* Peters.

(*b*) fore-arm between 37-38 mm.....*nasutus nasutus* Dobson.

Eptesicus nasutus nasutus Dobson, 1877. Sind Bat.

1877. *Vesperugo* (*Vesperus*) *nasutus Dobson*, J. Asiat. Soc. Bengal, 46, 2: 311. Shikarpur, Sind, Western India (Type-Ind. Ms. Calcutta No. 142a).

COLLECTING CENTRE (No. of Specimen): Junction of Razhai and Sichk rivers in Kharan state Baluchistan, West Pakistan (1).

HABITAT: Tropical thorn forest.

REMARKS: Specimen of this subspecies from Baluchistan in the B. M. Collection extends its range to this area in West Pakistan.

Eptesicus isabellinus bottae Peters, 1869.

1869. *Vesperus bottae* Peters, Mber. Preuss. Akad. Wiss. 406. Yemen, Arabia (Type-not known).

COLLECTING CENTRE (No. of Specimen) Shenkagarh, Astor (Azad Kashmir) (1).

HABITAT: Dry temperate forests.

REMARKS: According to Ellerman and Morrison-Scott (1951) the range of this subspecies includes Libya, Egypt and Arabia. There is only one specimen from Astor in the B. M. Collection, and so its range cannot be extended to Azad Kashmir as it may be only a straggler in this area.

(*ii*) Colour gray .....*Ceylonicus subcanus* Thomas.

B. Size smaller, fore-arm about 35 mm.

(*i*) Interfemoral membrane edged with white.
.....*kuhli kuhli* Kuhl.

(*ii*) Interfemoral membrane not edged with white.
.....*babu* Thomas.

C. Size smaller, fore-arm about 30 mm.
Anterior premolar entirely inside the tooth-row; interior incisor reaching higher than the outer cusp of outer incisor.

(*i*) Colour bistre brown .....*mimus mimus* Wroughton.

(*ii*) Colour mouse-grey .....*mimus glaucillus* Wroughton.

Pipistrellus mimus mimus Wroughton, 1899. Indian Pygmy Pipistrelle.

1899. *Pipistrellus mimus* Wroughton, J. Bombay N. H. Soc. 12: 722. Mheskatri, Dangs, Surat district, Western India (Type Adult ♂, B. M. No. 98.5.5.6).

REMARKS: There are no specimens of this subspecies from West Pakistan and East Pakistan in the B. M. Collection, but the specimens from Junagadh, Hissar, Midnapore and other areas indicate that this subspecies inhabits neighbouring areas in Pakistan.

Pipistrellus mimus glaucillus Wroughton, 1912.

1912. *Pipistrellus mimus glaucillus* Wroughton, J. Bombay N. H. Soc. 21: 769. Multan, Punjab, India (Type Adult ♂ B. M. No. 10.1.18.15; skin and skull complete).

COLLECTING CENTRES (No. of Specimens): Multan (3), Chakri (Salt Range) (2), Gambat (5) and Sukkur (1), all in West Pakistan.

HABITAT: Tropical thorn forests.

Pipistrellus ceylonicus chrysothrix Wroughton, 1899. Kelaart's Pipistrelle.

1899. *Pipistrellus chrysothrix* Wroughton, J. Bombay, N. H. Soc. 12: 720. Mheskatri, Surat Dangs, India (Type Adult ♂, B. M. No. 98.5.5.3).

REMARKS: Specimens of this subspecies from different places in Bengal in the B. M. Collection suggest that it will also ultimately be found in East Pakistan.

Pipistrellus ceylonicus subcanus Thomas, 1915.

1915. *Pipistrellus ceylonicus subcanus* Thomas, J. Bombay, N. H. Soc. 24: 30. Yalala, Junagadh, Kathiawar, India (Type Adult ♀ B. M. No. 13.8.8.30).

COLLECTING CENTRE (No. of Specimens): Landhi (Karachi), West Pakistan (4).

HABITAT: Tropical thorn forests.

Pipistrellus kuhli kuhli Kuhl, 1819. Kuhl's Pipistrelle.

1819. *Vespertilio kuhlii* Kuhl, Ann. Wetterau. Ges. Naturk. 4, 2: 199. Trieste (Italian-Yuguslavian border). Type unknown; Cotypes of *canus* Blyth, Ind. Mus. Calcutta Nos. 154 a and b; Type of *leucotis* Dobson, Ind. Mus. Calcutta No. 154P).

1845. *Pipistrellus lepidus* Blyth, J. Asiat. Soc. Bengal, 14: 340. Kandahar, Afghanistan (Type-not known).

REMARKS: *Status of Pipistrellus kuhli lepidus* and the number of specimens of *P. k. kuhli* in the B. M. Collection and those collected by Zoological Survey of Pakistan, have been dealt with in a separate paper "Notes on some bats of the Oriental Region".

Pipistrellus babu Thomas, 1915.

1915. *Pipistrellus babu* Thomas, J. Bombay N. H. Soc. 24: 30. Murree, 8000 ft., Punjab (Type Adult (?) B. M. No. 7.11.21.2).

COLLECTING CENTRES (No. of Specimens): Murree, West Pakistan (1) and Luskerpore, South Sylhet (East Pakistan) (1).

HABITAT: Dry temperate and Tropical evergreen forests.

Principal measurement (in mm.) of the specimens of *Pipistrellus* species examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
P. mimus mimus				
98.5.5.6, ♂, Mheshkatri, Surat, Dangs, India—Type ...	27.2	10.8	...	4.0
13.8.8.27, ♀, Junagadh State, India ...	28.1	10.3	...	3.8
15.4.3.24, ♂, Midnapore, Bengal, India ...	28.3	10.7	7.1	4.1
15.4.3.25, ♀, Midnapore, Bengal, India ...	28.2	10.6	7.0	4.1
15.9.1.20, ♀, Jalpaiguri, Bengal, India ...	28.1	10.0	...	3.6
16.7.29.13. ♀, Hasimara, Bhutan Duars, Bengal, India ...	27.9	10.0	6.8	3.7
25.6.10.3, ♂, Hissar, (Punjab), India ...	27.7	10.1	6.9	3.8
Average ...	27.9	10.4	6.9	3.9
P. mimus glaucillus				
10.1.18.15, ♂, Multan, West Pakistan-Type ...	29.1	10.4	...	3.7
10.1.18.13, ♂, Multan, West Pakistan ...	28.5	...	...	3.8
10.1.18.14, ♂, Multan, West Pakistan ...	27.6	9.6	6.6	3.7
10.1.18.16, ♀, Multan, West Pakistan ...	27.4	...	...	...
10.1.18.18, ♂, Sukkur, West Pakistan ...	28.6	...	...	...
10.1.18.19, ♀, Gambat, West Pakistan ...	28.7	...	...	...
10.1.18.20, ♀, Gambat, West Pakistan ...	28.6	...	...	...
10.1.18.21 ♀, Gambat, West Pakistan ...	26.7	...	...	...
10.1.18.22, ♀, Gambat, West Pakistan ...	27.2	9.8	6.9	3.7
10.1.18.23, ♀, Gambat, West Pakistan ...	28.1	9.8	...	3.5
23.11.3.1, ♀, Chakri, Salt Range West Pakistan ...	...	10.3	...	3.9
23.11.3.2, ♀, Chakri, Salt Range, West Pakistan ...	...	9.7	...	3.9
Average ...	28.0	9.9	6.7	3.7

Brit. Mus. No. Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
P. ceylonicus subcanus				
13.8.8.30, ♀, Yalala, Junagadh, India-Type ...	37.8	14.0	9.8	5.5
12.10.4.27, ♂, Bhuj, Cutch, India ...	35.3	13.5	9.1	5.6
13.8.8.28, ♂, Junagadh, India ...	36.5	...	...	...
13.8.8.29, ♀, Junagadh, India ...	35.9	...	...	...
15.11.1.14, ♂, Landhi (Karachi), West Pakistan	34.0	13.0	8.8	5.3
15.11.1.15, ♀, Landhi (Karachi), West Pakistan	38.3	13.2	9.0	5.4
15.11.1.16, ♀, Landhi (Karachi), West Pakistan	37.9	13.4	9.0	5.6
15.11.1.17, ♀, Landhi (Karachi), West Pakistan	35.3	13.1	8.6	5.4
Average ...	36.4	13.4	9.0	5.5
P. babu				
7.11.21.2, ♀, Murree, West Pakistan-Type ...	34.7	12.9	...	4.9
11.7.15.3, ♀, Luskerpore (South Sylhet), East Pakistan ...	...	12.3	7.9	4.9
13.10.26.4, ♂, Simla (Punjab), India ...	33.5	12.3	7.9	4.9
13.10.26.5, ♂, Simla (Punjab), India ...	32.4	...	...	4.6
13.10.26.6, ♀, Simla (Punjab), India ...	34.7	11.8	7.7	4.8
16.3.25.7, ♂, Darjeeling (Bengal), India ...	34.2	11.9	7.7	4.8
16.3.25.110, ♀, Darjeeling (Bengal), India ...	34.0	12.0	7.8	4.8
Average ...	33.9	12.2	7.8	4.8

Genus *NYCTICEIUS* Raginesque, 1819.

Sub-genus *Scoteinus* Dobson, 1875.

Nycticeius pallidus Dobson, 1875. Yellow Desert Bat.

1875. *Scotophilus pallidus* Dobson, Monogr. Asist. Chroptera, Appendix D, 186. Mian Mir, near Lahore, Punjab, North-western India (Type-Ind. Mus. Calcutta No. 161a).

COLLECTING CENTRES (No. of Specimens): Kashmor (Upper Sind Frontier) (2), Mirpur (1), Naundero (1), near Shikarpur (1)—all in West Pakistan; Khairpur Nathan Shah (Dadu district, Sind) (1) collected Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

Principal measurements (in mm.) of the specimens of *Nycticeius pallidus* examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
15.11.1.32, ♂, Kashmor (Upper Sind Frontier), West Pakistan ...	33.8	...	...	5.4
15.11.1.33, ♀, Kashmor (Upper Sind Frontier), West Pakistan ...	36.3	14.0	10.6	5.5
15.11.1.34, ♂, Mirpur (Sukkur), West Pakistan...	36.4	14.4	10.6	5.5
15.11.1.35, ♀, Naundero (Larkana), West Pakistan ...	37.3	14.8	...	5.9
91.11.1.1., ♀, Shikarpur, West Pakistan ...	...	14.6	11.0	5.9
Z.S.P. 26, ♂, K. N. Shah (Dadu district), West Pakistan ...	36.2	...	...	...
Average ...	36.0	14.4	10.7	5.6

Genus *SCOTOPHILUS* Leach, 1821.

REMARKS: A number of specimens of *Scotophilus* species in the B. M. Collection and also those collected by Zoological Survey of Pakistan, have been dealt with in a separate paper, "Notes on the status of bats of the genus *Scotophilus* from Southern Asia with key to the recognised forms".

Genus *OTONYCTERIS* Peters, 1859.

Characters of *Otonycteris hemprichi*:

Upper incisor larger and its shaft unicuspid.

Otonycteris hemprichi hemprichi Peters, 1859. Hemprich's long-eared Bat.

1859. *Otonycteris hemprichi* Peters, M. Ber. Preuss. Akad. Wise. 223. No locality (Type-Berlin Museum).

COLLECTING CENTRE (No. of Specimen): Gilgit (Azad Kashmir) (1).

HABITAT: Dry temperate forests.

Genus *PLECOTUS* Geoffroy, 1818.

KEY TO THE SPECIES

1. Size larger with fore-arm more than 40 mm.; general colour darker. .....*auritus wardi* Thomas.

2. Size smaller with fore-arm not more than 40 mm.; general colour paler. .....*auritus puck Barrett* Hamilton.

Plecotus auritus wardi Thomas, 1911. Long-eared Bat.

1911. *Plecotus wardi* Thomas, Ann. Mag. N. H. 7: 209. Leh, Ladak, Kashmir (Type Adult (?) B. M. No. 6.10.3.2; skin and skull-complete).

COLLECTING CENTRES (No. of Specimens): Pandrition (1) and Leh, Ladak (1), Kashmir.

HABITAT: Dry temperate forests.

Plecotus auritus puck Barrett-Hamilton, 1907.

1907. *Plecotus puck* Barrett-Hamilton, Ann. Mag. N. H. 20: 521. Murree, 7500 ft., Punjab, India, (?) Synonym of *homochrous* (Tate). (Type Adult (?) B. M. No. 5.11.19.1; skin and skull-complete).

COLLECTING CENTRE (No. of Specimen) :Murree (Punjab), West Pakistan (1).

HABITAT: Sub-tropical dry evergreen forest.

Principal measurements (in mm.) of the specimens of *Otonycteris* species and *Plecotus* species examined:

Brit. Mus. No., Sex and Locality		Fore-arm	Condylo-basal length	Zygomatic width	c-m³
O. hemprichi hemprichi					
78.3.13.1, (?) , Gilgit, Azad Kashmir	...	64.9	...	...	8.5
P. auritus wardi					
6.10.3.2, ♀, Leh, Ladak, Kashmir-Type	...	45.1	15.8	8.7	5.8
8.7.6.1, ♂, Leh, Ladak, Kashmir	...	45.0	...	...	...
8.7.6.2, ♂, Pandritton, Kashmir	...	43.2	...	...	...
P. auritus puck					
5.11.19.1, ♂, Murree, West Pakistan-Type	...	37.8	14.3	7.6	4.9

Sub-Family Murininae

Characters:

Nostrils tubular and elongated beyond the muzzle; feet small and metacarpals not graduated; canine and last upper molar normal.

Dental Formula: $i\frac{2-2}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{2-2}{2-2}$, $m.\frac{3-3}{3-3}$=34 teeth.

Genus *MURINA* Gray, 1842.

Characters of *Maurina tubinaris*:

Upper half of the outer margin of ear-conch concave; first upper premolar much smaller than the second; outer incisor distinctly shorter than the inner and does not touch the canine.

Murina* (*?*) *huttoni tubinaris Scully, 1881. Tube-nosed Bat.

1881. *Harpiocephalus tubinaris* Scully, P. Z. S. 200 Gilgit, Kashmir (Type-Ind. Mus. Calcutta).

HABITAT: Dry temperate forests.

Principal measurements (in mm.) of the specimens of *Murina tubinaris* Examined:

Brit. Mus. No., Sex and Locality	Fore-arm	Condylo-basal length	Zygomatic width	c-m³
3.9.29.2, ♂, Gilgit, Azad Kashmir ...	31.6	13.7	...	4.8
16.3.25.26, ♀, Darjeeling, (West Bengal), India	31.6	13.9	8.9	5.2
36.3.24.1, ♀, Chin Hills, Assam, India ...	31.3	14.0	9.0	5.2
36.3.24.2, ♀, Chin Hills, Assam, India ...	30.8	14.0	8.2	5.2
36.3.24.3, ♀, Chin Hills, Assam, India ...	30.2	13.9	...	5.2
36.3.24.4, ♀, Chin Hills, Assam, India ...	31.4	13.9	...	5.1
Average ...	31.1	13.9	8.7	5.1

Order PRIMATES

General Characters:

Mammals with first digit of hind foot the largest, opposable and prehensile and that of hand usually smaller.

General dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, $pm.\frac{3-3}{3-3}$, $m.\frac{3-3}{3-3}=36$ teeth.

The general characters and keys to families, genera and species have been abridged from Pocock (1939).

KEY TO THE SUB-ORDERS

1. Lips not free from the gums and not protrusible; skull with the orbit open behind and the upper incisors divided by a space in the middle.

Dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, $pm.\frac{3-3}{3-3}$, $m.\frac{3-3}{3-3}=36$ teeth.

.....*Prosimii.*

2. Lips free from the gums and protrusible; skull with the orbit closed behind and the upper incisors not divided by a space in the middle.

Dental formula: $i\frac{2-2}{2-2}$, $c\frac{1-1}{1-1}$, $pm.\frac{2-2}{2-2}$, $m.\frac{3-3}{3-3}=32$ teeth.

.....*Anthropoidea.*

Sub-order PROSIMII.

Characters of Infra-order *Lorisiformes:*

Fourth digit of hand and foot never shorter than the third; second digit of foot with a distinct claw, different from the flat nail of the rest of the digits.

Characters of the family *Lorisidae:*

Tail short or absent; tympanic bone large and external to the bulla to form its outer wall.

Characters of the genus *Nycticebus:*

Tail short and bushy; ears small and the limbs stout; skull with shorter snout and palate; incisors either only two or four of unequal size, the inner pair much larger than the outer one.

Genus *NYCTICEBUS* E. Geoffroy, 1812.

Characters of *N. coucang bengalensis:*

Size large; colour of head and neck mostly whitish grey or grey; median narrow stripe on the nape and upto the middle of crown.

Nycticebus coucang bengalensis Fischer, 1804. Slow Loris.

1804. *Loris bengalensis* Fischer, Anat. Maki, 1 : 30. Bengal (Type-not known).

COLLECTING CENTRE (No. of Specimen): Chittagong hill Tracts, East Pakistan (1).

HABITAT: Tropical evergreen forests.

Skull measurements (in mm.) of the specimens of *N. c. bengalensis* examined.

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Orbital width	Maxillary width at canine	c-m³	Mandibular length
21.11.11.1, (?) Naga Hills, Assam ...	62.3	...	...	14.7	24.2	42.0
26.10.8.9, ♀, Chittagong Hill Tracts ...	62.7	42.7	39.4	14.3	23.0	44.0
42.62, ♀, Naga Hills Assam ...	64.0	46.6	39.7	14.3	23.9	43.0
Average ...	63.0	44.6	39.5	14.4	23.7	43.0

Sub-order ANTHROPOIDEA

KEY TO THE SUPERFAMILIES

Skull with bony tubular auditory meatus; only two premolars instead of three in the upper and lower jaws.

1. Arms much longer than the legs; no external tail. .....*Hominoidea.*
2. Arms and legs subequal in length; external tail present. .....*Cercopithecidea.*

Superfamily CERCOPITHECIDEA

Family CERCOPITHECIDAE

KEY TO THE SUB-FAMILIES

1. Cheek-pouches present; tail variable.....*Cercopithecinae.*
2. Cheek-pouches absent; tail always long and prehensile. .....*Colobinae.*

Sub-family Cercopithecinae

Genus *MACACA* Lacepede, 1799.

Characters of *Macaca mullata:*

Colour of body fur not black; no ruff of hair on each side of the face; tail conspicuous, hairy and less than three-fourth of head and body; hind-quarters orange red and brighter than the fore-quarters.

KEY TO THE SUB-SPECIES

(*a*) Smallest race, muzzle weak and brow-ridge not prominent. .....*M. mulatta* Zimm.

(*b*) On the average a heavier form; brow-ridges prominent. .....*M. villosa* True.

(*c*) On the average a much heavier form; bigger skull with the brow-ridges higher and more prominent; coat longer. .....*M. mcmahoni* Pocock.

Macaca mulatta mulatta Zimmermann, 1780. Rhesus Macaque.

1780. *Cercopithecus mulatta* Zimm., Geogr. Gesch. Mensch. 2: 195. "India". (Type not known).

COLLECTING CENTRE (No. of Specimen): Chittagong Hill Tracts, East Pakistan (1).

HABITAT: Tropical evergreen forests.

Macaca mulatta villosa True, 1894.

1894. *Macacus rhesus villosus* True, Proc. U. S. Nat. Mus. 17: 2. Lolab, northern end of Wular Lake, Kashmir (Type-U.S.N.M. no. $\frac{20120}{35485}$).

COLLECTING CENTRES (No. of Specimen): Patriata (Murree), West Pakistan (1), Kashmir (1).

HABITAT: Sub-tropical dry evergreen forest.

Macaca mulatta mcmahoni Pocock, 1932.

1932. *Macaca mulatta mcmahoni* Pocock, J. Bombay N. H. Soc. 35: 544. Kootai, in Lower Chitral, 3600 ft. (West Pakistan) (Type Adult ♂, B. M.No. 20.6.11.1; skin and skull-complete).

COLLECTING CENTRE (No. of Specimen): Kootai (Lower Chitral), West Pakistan (1).

HABITAT: Dry temperate forests.

Skull measurements (in mm.) of the specimens of *Macaca* species examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Orbital width	Maxillary width at canine	c-m³	Mandibular length
M. mulatta mulatta						
16.7.29.1,♂, Hasimara, Bhutan Duars ...	88.8	84.6	64.6	29.8	41.5	79.3
26.10.8.7,♂, Chittagong Hill Tracts ...	94.9	81.8	65.4	31.0	39.4	83.8
31.1.11.3, (?) Darg (Surat), Bombay ...	78.1	68.8	57.4	22.8	35.3	66.7
45.1.8.223, (?) Nepal ...	91.7	...	68.0	32.9	42.2	81.9
50.373, ♂, Baumvang, upper Burma ...	83.5	75.1	61.5	29.3	38.2	71.9
Average ...	87.4	77.6	63.4	29.2	39.3	76.7
M. mulatta mcmahoni						
20.6.11.1, ♂, Kootai, Lower Chitral (West Pakistan)-Type ...	108.9	97.3	80.6	37.6	46.0	94.3
M. mulatta villosa						
23.9.1.118, ♂, Kangra Fort Punjab ...	98.6	90.7	72.1	35.6	41.1	85.1
23.11.4.1, ♂, Patriata, Murree, Punjab ...	101.8	93.1	74.7	34.2	43.6	...

Brit Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Orbital width	Maxillary width at canine	c-m³	Mandibular length
31.1.11.34, ♂, Samyala Kangra Valley Punjab	87.4	81.9	63.5	30.0	40.3	76.8
33.12.1.2, ♂, Dharamsala Punjab ...	76.2	70.6	55.8	28.1	33.0	64.1
71.3.3.5, ♀, Kashmir ...	69.7	68.0	56.0	24.2	33.0	59.5
Average ...	86.7	80.9	64.4	30.4	38.2	71.4

Sub-family COLOBINAE

Genus *PRESBYTIS* Eschscholtz, 1821.

KEY TO THE SPECIES

1. Whiskers short and not covering the ears; face not black,; hands and feet black; general body-colour sepia-brown but paler on shoulders and head; tip of tail and legs below the knee often paler .....*entellus entellus* Dufresne.

2. Whiskers long and the hair of crown form a cap; face black;
   (*a*) Breast, throat and whiskers pale, at most tinged with buff, abdomen greyish white at least in adult.
   .....*pileatus pileatus* Blyth.
   (*b*) Breast, throat and whiskers bright rusty red, head and nape slaty-grey, upper coat paler, red suffusing underside at least to groins.....*pileatus durga* Wroughton

Presbytis entellus entellus Dufresne, 1797. Langur

1797. *Simia entellus* Dufresne, Bull. Soc. Philom. Paris, 1, 7: 49. Bengal. India (Type-not known.)

REMARKS: There is no specimen of this subspecies from East Pakistan in the B. M. Collection, although specimens from West Bengal are represented. Its range includes Bengal according to Ellerman and Morrison-Scott (1951).

Presbytis pileatus pileatus Blyth, 1843. Capped Monkey.

1843. *Semnopithecus pileatus* Blyth, J. Asiat. Soc. Bengal, 12: 174. Locality unknown "received from Barrackpore, stated to be Malayan" (Blyth); "no doubt Assam" (Pocock), (Type-Ind. Mus. Calcutta No. 14d).

COLLECTING CENTRE (No. of Specimen): Sylhet, East Pakistan (1).

HABITAT: Tropical evergreen forests.

Presbytis pileatus durga Wroughton, 1916.

1916. *Presbytis durga* Wroughton, J. Bombay N. H. Soc. 24: 655. Cachar, Assam (Type adult ♂, B. M. No. 86.10.18.1).

COLLECTING CENTRE (No. of Specimen): Chittagong Hill Tracts. East Pakistan (1).

HABITAT: Tropical evergreen forests.

Skull measurements (in mm.) of the specimens of *Presbytis* species examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Orbital width	Maxillary width at canine	c-m³	Mandibular length
P. entellus entellus						
15.4.3.3, ♂, Hazaribagh - West Bengal	104.2	105.3	82.3	40.0	45.5	95.8
15.4.3.4, ♀, Midnapore, West Bengal ...	85.2	88.6	66.0	27.6	40.1	77.8
56.5.6.11, (?) Hazaribagh, West Bengal ...	103.0	102.0	77.4	36.4	45.5	93.6
Average ...	97.5	98.6	75.2	34.7	43.7	89.0
P. pileatus pileatus						
20.11.1.1, ♂, Tura, Garo Hills, Assam ...	89.7	88.4	69.1	32.4	35.0	81.0
20.11.1.2, ♀, Tura, Garo Hills, Assam ...	76.4	75.0	64.6	26.4	34.0	69.5
79.11.21.597, (?), Sylhet, East Pakistan ...	70.3	...	57.3	23.0	27.5	62.2
Average ...	78.8	81.7	63.7	23.9	32.2	70.9
P. pileatus durga						
21.7.13.7, ♀, Lamsarpang, Cachar Hills ...	74.4	77.0	66.3	27.3	34.8	69.9
21.7.16.3, ♀, Lakhuni, Naga Hills, Assam ...	84.2	78.8	66.7	29.4	35.5	78.2
26.10.8.1, ♂, Chittagong Hill Tracts, East Pakistan ...	85.3	81.1	66.4	29.7	35.6	78.3
Average ...	81.3	78.9	66.5	28.8	35.3	75.5

Super-family HOMINOIDAE

Family PONGIDAE

Sub-family Hylobatinae

Genus *HYLOBATES* Illiger, 1811

Characters of *Hylobates hoolock:*

Hands and feet the same colour as the arms and legs; face not encircled with a white ring, instead a white or grey band present across the forehead.

Hylobates hoolock Harlan, 1834. Hoolock Gibbon.

1834. *Simia hoolock* Harlan, Trans. Amer. Phil. Soc. 4: 52, Pl. 2. Garo Hills, Assam. (Type-not known).

REMARKS: There is no specimen of this species from East Pakistan in the B. M. Collection, although according to Ellerman and Morrison-Scott (1951) its range includes Assam and Chittagong.

Skull measurements (in mm.) of the specimens of *Hylobates hoolock* examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Orbital width	Maxillary width at canine	c-m³	Mandibular length
No. 33, ♀, Barra Hapjan, Lakhimpur, Assam ...	92.6	71.1	62.3	32.1	35.5	73.1
37.3.24.6, ♀, Margharita, Naga Hills, Assam ...	90.3	67.8	61.1	32.1	35.8	73.2
91.10.7.2, ♀, Sadiya, Assam ...	95.1	70.9	64.7	32.1	38.3	76.6
Average ...	92.7	69.6	62.7	32.1	36.5	74.3

Order PHOLIDOTA

GENERAL CHARACTERS:

Burrowing mammals with the upper surface and sides of the body covered with large imbricate horny scales; all five toes with slightly curved claws; skull without teeth.

Family MANIDAE

Genus *MANIS* Linnaeus, 1758

Characters of *Manis crassicaudata:*

Hind foot short and stumpy and the coarsely granular pads extend up to the base of the claws; fore-claws about twice the length of the hind claws; 11 to 13 rows of scales round the body.

Manis crassicaudata Gray, 1827. Indian Pangolin.

1827. *Manis crassicaudatus* Gray, in Griffith's Cuvier Anim. Kingd. 5: 282. India (Type not known).

REMARKS: There is no specimen of this species in the (N. H.) collection from Pakistan, although according to Ellerman, and Morrison-Scott (1951) its range includes East and West Pakistan.

Order CARNIVORA

GENERAL CHARACTERS:

Flesh eating mammals with posterior upper premolar and anterior lower molar developed as special carnassial.

The General Characters and Keys to Families, Genera and species have been abridged from Pocock (1939, 1941) and Ellerman and Morrison-Scott (1951).

KEY TO THE SUPERFAMILIES

1. Ethmoturbinals not very large and excluded from the anterior orifice of the nasal chambers; auditory bullae composed of a single bone and not divided into two chambers. ..... CANOIDEA.

2. Ethmoturbinals very large and extended to the anterior orifice of the nasal chambers: auditory bullae composed of two bones and divided by a partition into two chambers. ..... FELOIDEA.

Superfamily CANOIDEA

KEY TO THE FAMILIES

1. Hind foot with four toes; the fore-foot with five digits, the first, smaller, raised above the plantar pad.

Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, pm.$\frac{4-4}{4-4}$, $m\frac{2-2}{3-3}$ or $\frac{2-2}{2-2}$

..... CANIDAE.

2. Hind foot with five toes; the fore-foot also with five digits, the first, smaller, not raised above the plantar pad. (*i*) Size large; tail small; alisphenoid canal present.

Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, pm.$\frac{4-4}{4-4}$, $m\frac{2-2}{3-3}$=42 teeth.

..... URSIDAE.

(*ii*) Size small; tail long; alisphenoid canal absent.

Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, pm.$\frac{4-4}{4-4}$, $m\frac{1-1}{2-2}$=38 teeth.

..... MUSTELIDAE.

Family CANIDAE

KEY TO THE GENERA

1. Lower jaw with three molars; nasals not expanded in their posterior half.

   (*i*) Interorbital region elevated; postorbital processes convex above. .....*Canis* Linnaeus.

   (*ii*) Interorbital region not elevated; postorbital processes not convex above .....*Vulpes* Oken.

2. Lower jaw with two molars; nasals expanded in their posterior half.

   The second lower and first upper molars reduced in size.

   .....*Cuon* Hodgson.

Genus *CANIS* Linnaeus, 1758.

KEY TO THE SPECIES

1. Size large; frontal area of skull elevated; cingulum on outer border of the first upper molar narrow, tending to be incomplete at the middle ..... *lupus* Linnaeus.

   (*i*) Larger form with much woolly long under fur. ..... *lupus chanco* Gray.

   (*ii*) Smaller form with little or no woolly under fur. ..... *lupus pallipes* Sykes.

2. Size small; frontal area of skull not elevated; cingulum on the outer margin of the first upper molar broad and conspicuous. ..... *aureus* Linnaeus.

   (*i*) Upper fur black and white with pale buff or grey shades. ..... *aureus aureus* Linnaeus.

   (*ii*) Upper fur darker than the above.....*aureus indicus* Hodgson.

Canis lupus pallipes Sykes, 1831. Wolf.

1831. *Canis pallipes* Sykes, P. Z. S. 101. Deccan, India (Type young ♂ B. M. No. 42.8.6.2, skin in good order; skull No. 43.4.6.60 (159a)-complete).

COLLECTING CENTRES (No. of Specimens): Khojdar (Baluchistan) (1), Karachi (2), Sind (1) and Punjab (1)-all in West Pakistan.

HABITAT: Tropical thorn forest.

Canis lupus chanco Gray, 1863.

1863. *Canis Chanco* Gray, P. Z. S. 94. Chinese Tartary (Type Adult ♂ B. M. No. 63.3.20.1).

COLLECTING CENTRES (No. of Specimens): Gilgit, Azad Kashmir (6); Chitral (2), Chotair (Loralai), Baluchistan (1), Rawalpindi (1) West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

REMARKS: The specimens from Gilgit, Chitral and Rawalpindi in the B. M. Collection, establish its range to include Azad Kashmir and northern hilly areas of West Pakistan, not included by Ellerman and Morrison-Scott (1951).

Canis aureus aureus Linnaeus, 1758. Asiatic Jackal.

1758. *Canis aureus* Linnaeus, Syst. Nat. 10th ed. 1: 40. Province of Lar, Persia (Type-not known.)

1916. *Canis indicus kola* Wroughton, J. Bombay N. H. Soc. 24: 651. Palanpur, Gujerat, Western India (Type Adult ♀ B. M. No. 16.4.16.12).

COLLECTING CENTRES (No. of Specimens): Rawalpindi (3); Dhalwal (1) and Chakri (1) Salt Range, Multan (2); Jacobabad (3), Gambat (3); Panoaqil (1), Naundero (Larkana) (2), Thar Parkar (4), Thatta (1) and Garo (1); Panjgur (5), Khojdar (2) and Mastung (1) all in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: Ellerman and Morrison-Scott (1951) indicated its range from Baluchistan to Western India (Cutch, Sind, Gujerat), but the specimens from Rawalpindi, Multan, Dhalwal and Chakri (Punjab) in West Pakistan, extend its range to these areas.

Canis aureus indicus Hodgson, 1833.

1833. *Canis aureus indicus* Hodgson, Asiat. Res. 18, 2: 257. Nepal (Type Adult (?), B. M. No. 43.1.12.29).

REMARKS: The specimens from Nepal, Bhutan, Assam and Burma in B. M. Collection indicate that this species is likely to occur in East Pakistan.

Skull measurements (in mm.) of the specimens of *Canis* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
C. lupus pallipes					
43.4.6.60, ♂, Deccan, India-Type ...	160	89	38	37	123
35.1.18.7, ♀, Khojdar, Baluchistan, West Pakistan ...	166	90	38	31	135
56.9.22.24, (?), Punjab, West Pakistan	...	...	...	37	170
82.12.2.1, ♀, Karachi, West Pakistan	...	...	41	37	147
98.3.3.1, ♀, Karachi, West Pakistan	200	114	38	36	157
Average ...	175	97	38	35	146
C. lupus chanco					
63.3.20.1, ♂, Chinese Tartary-*Type*	203	130	43	45	178
20.1.17.4, (?), Chitral, West Pakistan	215	116	...	41	176
20.1.17.5, (?), Gilgit, West Pakistan...	216	124	44	42	175
33.7.20.6, ♂, (Young), Gilgit, West Pakistan ...	190	109	42	40	154
34.8.12.2, ♀, Chotair (Loralai), West Pakistan ...	204	...	50	43	170
35.1.10.2, ♀, Chitral, West Pakistan	217	128	48	47	175
35.1.10.3, ♀, Rawalpindi, West Pakistan	187	115	42	37	151
Average ...	211	125	46	44	175
C. aureus aureus ...					
16.4.16.12, ♀, Palanpur, Gujerat-*Type* ...	144	83	29	27	114
23.7.6.24, (?), Jacobabad, West Pakistan ...	142	85	31	26	114
23.7.6.38, ♀, Gambat, West Pakistan	136	76	26	25	111
23.7.6.57, ♀, Rawalpindi, West Pakistan ...	141	82	29	26	112
25.10.3.2, (?) Pathankote, Punjab ...	137	79	31	27	109
37.5.26.25, ♂, Pathankote, Punjab ...	151	85	31	27	119
Average ...	142	82	30	26	113

Genus *VULPES* Oken, 1816.

KEY TO THE SPECIES

1. Nasals on the average narrower posteriorly; upper carnassial (pm^4) relatively larger than the first upper molar.

   (a^1) Tip of the tail white; back of ear not of the same tint as head and nape; condylobasal length of the smallest skull over 100 mm. .....*vulpes* Linnaeus.

   (*i*) Larger form with uniformly red upper coat and ashy under fur overcast with white.....*vulpes montana* Pearson.

   (*ii*) Smaller form with the fur paler red.

   ..... *vulpes griffithii* Blyth.

   (*ii*) Smaller form with the fur never of red colour.

   ..... *vulpes pusilla* Blyth.

   (*b*) Tip of the tail black; back of ear nearly the same tint as head and nape; condylobasal length of the adult skull about 91 mm. .....*cana* Blanford.

2. Nasals on the average broader posteriorly; upper carnassial (pm^4) relatively smaller than the first upper molar.

   Tip of tail black; back of ear nearly of the same tint as head and nape; condylobasal length of adult skull about 118 mm. .....*bengalensis* Shaw.

Vulpus vulpus montana Pearson, 1836. Common Red Fox.

1836. *Canis vulpes* montana Pearson, J. Asiat. Soc. Bengal, 5: 313. (January, 1836) Himalayas (Type Ind. Mus. Calcutta No. d^2).

1837. *Canis himalaicus* Ogilby, P. Z. S. 1836, 103 (20 February, 1837). Mussooree, Kumaon, North-Western India (Type (?) B. M. No. 55.12.24.237).

1906. *Vulpes waddelli* Bonhote, Abstr. P. Z. S. 14; P. S. Z. 303. Kambajong, Tibet (Type Adult ♂, B. M. No. 5.4.6.1).

COLLECTING CENTRE (No. of Specimen): Gilgit (1) and Hunza (1)-all in Azad Kashmir.

HABITAT: Dry temperate forests.

Vulpes vulpes pusilla Blyth, 1854.

1854. *Vulpes pusillus* Blyth, J. Asiat. Soc. Bengal, 23: 729. Salt Range, Punjab (Type-Ind. Mus. Calcutta No. 1).

1875. *Vulpes persicus* Blanford, Ann. Mag. N. H. 16: 310. Shiraz, Persia (Cotype Adult ♂, B. M. No. 74.11.21.2).

COLLECTING CENTRES (No. of Specimens): Compbellpore (1), Rawalpindi (1), Ara (3) and Salt Range (6)-all in Punjab; Kashmor (1), Khairpur (1), Sukkur (3), Rohri (2), Umarkot (1), Panoaqil (1), Wahi Pandi (1) and Thar Parkar (59)-all in Sind; Khojdar (2), Mand (2), Turbat (1), Sibbi (1), Wadh (1) and Mekran coast (1)-all in Baluchistan.

HABITAT: Tropical thorn forests.

Vulpes vulpes griffithi Blyth, 1854.

1854. *Vulpes griffithi* Blyth, J. Asiat. Soc. Bengal, 23: 730. Kandahar, Afghanistan (Type Ind. Mus. Calcutta No. W.)

COLLECTING CENTRES (No. of Specimens): Murree Hills (2), Gharial (1) and Wana (S. Waziristan) (1)-all in West Pakistan.

HABITAT: Sub-tropical dry evergreen forests.

Vulpes bengalensis Shaw, 1800. Bengal Fox.

1800. *Canis bengalensis* Shaw, Gen. Zool. 1, 2: 30 Bengal (Type-not known).
1837. *Canis chrysurus* Gray, Charlesw. Mag. N. H. 1: 577. Nepal (Type Adult ♂ B. M. No. 37.6.10.48).

COLLECTING CENTRES (No. of Specimens): Gambat (i), Kotdiji (Khairpur) (1), Sukkur (2); Ghangra (1) and Mithi Tal (1) in Thar Parkar.

HABITAT: Tropical thorn forests.

Vulpes cona Blanford, 1877. Blanford's Fox.

1877. *Vulpes cana* Blanford, J. Asiat. Soc. Bengal, 64, 2: 321. Gwadar, Baluchistan (Type Adult (?) B. M. No. 78.4.23.1).

COLLECTING CENTRES (No. of Specimens): Turbat (1); Bajaur (N. W. F. Province) (1) in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: There is one skin from Bajaur (North-West Frontier region of West Pakistan) in the B. M. Collection and therefore the range should extend from Baluchistan to this region.

Skull measurements (in mm.) of the specimens of *Vulpes* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post orbital width	Maxillary width	Mandibular length
V. vulpes montana					
55.12.24.237 (?), Mussoorree, Kumson, India-*Type* ...	...	71.0	21.0	22.0	108.0
5.4.6.1, ♂, Kambajong, Tibet-*Type*...	136.0	72.0	23.0	23.0	107.0
8.3.9.4, (?), Simla, India ...	128.3	70.7	20.0	21.1	103.0
36.4.4.3, ♂, Gopalpur, Kangra Valley, India ...	138.3	78.2	20.7	25.0	109.8
36.4.4.5, ♀, Samyala, Kangra Valley, India ...	125.9	71.5	18.8	20.3	98.0
85.8.1.58, ♀ Simla, India	128.0	74.2	22.1	21.5	103.3
77.11.23.2, ♀, Hunza, Azad Kashmir	119.2	...	24.4	20.3	94.7
176C (?), Gilgit, Azad Kashmir ...	...	66.2	23.0	22.4	...
Average ...	129.3	71.9	21.6	21.9	103.4
V. valpes pusilla					
74.11.21.2, ♂, Shiraz, Persia-Cotype	125.0	71.5	21.5	21.0	101.0
19.11.7.21, ♀, Nasirabad (Turbat), West Pakistan ...	120.0	65.3	19.3	19.1	95.8
19.11.8.12, ♀, Khojdar, West Pakistan ...	123.0	64.7	19.4	18.7	99.0
20.6.12.1, ♀, Salt Range, Punjab, West Pakistan ...	108.2	64.7	20.6	17.8	86.0
36.4.4.11, ♂, Ara, Salt Range, Punjab, West Pakistan ...	121.1	67.4	23.4	19.5	93.5
43.211, ♂, Thar Parkar, Sind, West Pakistan ...	119.8	65.2	17.0	18.0	94.9
43.230, ♂, Thar Parkar, Sind, West Pakistan ...	114.2	59.1	23.0	17.3	84.9
43.232, ♀, Umarkot, Sind, West Pakistan ...	97.4	54.3	21.8	15.8	77.0
Average ...	116.1	64.0	20.7	18.4	91.5
V. vulpes griffithi					
7.11.21.10, ♀, Gharial, Murree, West Pakistan ...	124.4	72.0	20.6	21.3	100.4

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
20.6.12.2, (?), Wana Waziristan, West Pakistan ...	124.7	68.0	23.1	20.9	100.0
23.11.4.52, ♂, Murree Hills, West Pakistan ...	126.5	70.0	22.0	21.4	102.4
90.11.11.1, ♂, Murree Hills, West Pakistan	125.3	72.1	20.9	21.3	100.4
Average ...	125.2	70.5	21.6	21.2	100.8
V. bengalensis					
37.6.10.48, ♂, Nepal-*Type* ...	111.0	69.0	18.0	20.0	95.0
12.1.9.4, ♂, Thar Parkar West Pakistan ...	106.6	63.7	20.2	17.5	87.4
15.11.1.76, ♀, Gambat, West Pakistan ...	99.9	57.3	18.2	15.7	78.6
36.4.4.16, ♀, Mirpur Sukkur, West Pakistan ...	103.3	60.2	18.5	17.9	83.1
36.4.28.20, ♂, Sukkur, West Pakistan ...	90.0	58.8	20.5	16.4	71.0
36.4.28.25, ♀, Haldibari, Bengal ...	104.7	59.5	19.0	16.4	...
91.10.7.28, ♀, Kotdiji (Khairpur), West Pakistan ...	99.1	55.8	19.0	15.4	78.8
Average ...	102.1	60.6	19.0	17.0	82.3
V. rana					
78.4.23.1, (?) Gwadar (Baluchistan) West Pakistan-*Type* ...	89.0	51.0	18.5	13.5	69.0
19.11.7.22, ♂, Turbat (Baluchistan), West Pakistan ...	91.0	...	19.2	13.5	71.3

Family URSIDAE

KEY TO THE GENERA

1. Digital pads never fused; median upper incisors present; a distinct postcanine space present.

(*i*) Jaws longer in comparison with the cranium.
..... *Ursus* Linnaeus.

(*ii*) Jaws shorter in comparison with the cranium.
..... *Selenarotos* Heude.

2. Digital pads fused; median upper incisors absent; no distinct postcanine space ..... *Melursus* Meyer.

Genus *URSUS* Linnaeus, 1758.

Ursus arctos isabellinus Horsfield, 1826. Red Bear.

1826. *Ursus isabellinus* Horsfield, Trans. Linn. Soc. Zool. 15: 334. Mountains of Nepal (Type not known).

COLLECTING CENTRES) No. of Specimens): Bassein (Gilgit) (1), Donahung Nullah (Kistwar) (1), Shingo Shingar River in Kashmir (1), Kullu (Punjab) (3).

HABITAT: Dry temperate forests.

Genus *SELENARCTOS* Heude, 1901.

KEY TO THE SPECIES

1. Form large, fur black occasionally tinged with brown in parts.
   (*i*) Fur short and thin with practically no underwool.
   ..... *thibetanus* G. Cuvier.
   (*ii*) Fur longer and thicker with abundant underwool.
   ..... *laniger* Pocock.
2. Form smaller, fur brown or reddish brown.
   ..... *gedrosianus* Blanford.

Selenarctos thibetanus thibetanus G. Cuvier, 1823 Asiatic Black Bear.

1823. *Ursus thibetanus* G. Cuvier, Ossements Foss. 4: 325. Sylhet. Assam.

REMARKS: Type locality of this species is Sylhet, East Pakistan but there is no specimen from this part of Pakistan in the B. M. Collection.

Selenarctos thibetanus gedrosianus Blanford, 1877.

1877. *Ursus gedrosianus* Blanford, Proc. Asiat. Soc. Bengal, 204. Tump, 70 miles north of Gwadar, on the Makran Coast, Baluchistan (Type—not known).

REMARKS: The type locality is in West Pakistan. There is no specimen from West Pakistan in the B. M. Collection.

Selenarctos thibetanus laniger Pocock, 1932.

1932. *Selenarctos thibetanus laniger* Pocock. J. Bombay N. H. Soc. 26: 115. Aru, Upper Lidder Valley, Kashmir (Type Adult ♀ B. M. No. 97.5.6.1).

COLLECTING CENTRES (No. of specimens): Dunga gali (MURREE) (1); Poonch (2) and Dachigam (2) in Kashmir.

HABITAT: Sub-tropical dry evergreen forests.

Skull measurements (in mm.) of the specimens of *Selenarctos laniger* examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
97.5.6.1, ♀, Aru, Kashmir-*Type* ...	...	170.0	75.0	56.0	178.0
20.12.13.2, (?) Dunga gali, Murree ...	...	201.0	81.0	64.0	200.0
27.2.7.4, ♂, Shamashubi Mts., West Kashmir ...	...	169.0	65.0	58.0	192.0
32.5.7.7, (?) , Dachigam, Kashmir ...	...	193.0	78.0	62.0	194.0
Average ...	...	183.2	74.7	60.0	191.0

Genus *MELURSUS* Meyer, 1793.

Melursus ursinus ursinus Shaw, 1791. Sloth Bear.

1791. *Bradypus ursinus* Shaw, Nat. Misc. 2 (unpaged), Pls. 58-59. Patna, on the Ganges, Bengal (Type not known).

REMARKS: The range of this species includes East Pakistan according to Ellerman and Morrison-Scott (1951). There is no specimen from East Pakistan in the B. M. Collection.

Family MUSTELIDAE

KEY TO THE SUBFAMILIES

1. Upper molar subquadrate, its area three or four times that of the carnassial (Pm4).

   Terrestrial form, claws long and not retractile; carpal and metacarpal pads small and separated from each other and from the plantar pad; muzzle snout-like.....*MELINAE.*

2. Upper molar transversely elongate, wider than long, its area less than that of the carnassial (pm4).

   (*a*) Terrestrial form; upper carnassial with inner lobe reduced.

   (*i*) Second lower molar absent; cavity of bulla opening into the hollow of mastoid; carpal and metatarsal pads confluent and in contact with plantar pads; claws long and not retractile; muzzle not snout-like.

   .....MELLIVORINAE.

   (*ii*) Second lower molar present; cavity of bulla usually closed;

metatarsal pads absent; claws short and partially retractile; premolars 3/3.....MUSTELINAE.

(*b*) Semiaquatic form; upper carnassial with inner lobe expanded. Fur waterproof; tail thick and muscular.

.....LUTRINAE.

Subfamily Mustelinae

KEY TO THE GENERA

1. Premolars $\frac{4-4}{4-4}$; dorsal and ventral fur of uniform colour, throat paler. ..... *Martes* Pinel.

2. Premolars $\frac{3-3}{3-3}$.

(*i*) Lower carnassial (m1) with distinct inner cusp; fur on back with black and yellow irregular lines and blotches; abroad white band across back of head joining pale lateral stripe of neck .....*Vormela* Blasius.

(*ii*) Lower carnassial (m1) without inner cusp; dorsal and ventral fur of uniform colour; ear with well developed bursa. .....*Mustela* Linn.

Genus *MARTES* Pinell 1792.

KEY TO THE SPECIES

1. Tail half of head and body length; dark band on throat or the nape absent. .....*foina intermedia* Severtzov.

2. Tail three fourth of head and body length; dark band on throat or on the nape very prominent.....*flavigula flavigula* Boddaert.

Subgenus *Martes* Tinel, 1792.

Martes foina intermedia Severtzov, 1873. Beech Marten.

1873. *Mustela intermedia* Severtzov, Mem. Soc. Amis. Sci. Nat. Moscow, 8, 2: 61. 1876, Ann. Mag. N. H. 18: 45. Basin of the Chu, Tallas, and Naryn, from 4000 to 9000 ft., Eastern Turkestan (Type not known).

COLLECTING CENTRES (No. of Specimens): Gilgit, Azad Kashmir (1), Hazara (N.W.F. Province) (1) in West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

REMARKS: The range should be extended to Hazara (N.W.F. area of West Pakistan) on account of the specimen in the B. M. Collection. Ellerman and Morrison-Scott (1951) did not indicate this.

Subgenus *Charronia* Gray, 1865.

Martes flavigula flavigula Boddaert, 1785. Yellow-throated Marten.

1785. *Mustela flavigula* Boddaert, Elench. Anim. 88. Locality unknown, Traditionally fixed as Nepal (Pocock). (Type not known).

COLLECTING CENTRES (No. of Specimens); Peshawar (1), Hazara (1), Nathia gali (1) in North West Frontier Province; Dunga gali (1), Murree (1) in Punjab; Gugga Nullah (1), Kistwar (1) and Kashmir (1).

HABITAT: Sub-tropical dry evergreen forests.

REMARKS: The specimens from Dunga gali and Murree in Punjab in the B. M. Collection extend the range of this species to these places in West Pakistan. This was not mentioned by Ellerman and Morrison-Scott (1951) in the Checklist.

Skull measurements (in mm.) of the specimens of *Martes flavigula flavigula* examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post orbital width	Maxillary width	Mandibular length
10.1.19.66, ♂, Gugga Nullah, Kashmir ...	100.4	61.4	25.1	21.2	66.5
13.2.9.1, ♂, Kistwar, Kashmir ...	100.1	66.1	28.9	22.9	65.1
20.10.27.10, ♂, Nathiagali, West Pakistan ...	101.8	59.0	24.8	21.4	66.8
20.10.27.11, (?), Dungagali, West Pakistan ...	100.9	...	24.2	22.2	66.0
Average ...	100.8	62.1	25.7	21.9	66.1

Genus *MUSTELA* Linnaeus, 1758.

KEY TO THE SPECIES

1. Size smaller; tail tip black and less than half of head and body length. .....*erminea ferghanae.*
2. Size larger; tail of uniform colour and more than half of head and body length. .....*altaica temon.*

Subgenus *Mustela* Linnaeus, 1758.

Mustela erminea ferghanae Thomas, 1895. Stoat.

1895. *Putorius ermineus ferghanae* Thomas, Ann. Mag. N. H. 15: 452. Mt.

Kara Karyk, Ferghana, Eastern Russian Turkestan (Type Adult ♂ B. M. No. 94.9.2.2.).

1908. *Mustela whiteheadi* Wroughton, J. Bombay N. H. Soc. 18: 882. Kaghan Valley, Hazara, Northern India (Type Adult ♂ B. M. No. 8.10.3.1).

COLLECTING CENTRES (No. of Specimens): Kaghan Valley (8) and Laspur (Chitral) (1) in West Pakistan.

HABITAT: Dry temperate forests.

REMARKS: The specimens from Kaghan Valley and Chitral in the B. M. Collection extend its range from Kashmir to the North West Frontier areas of West Pakistan.

Mustela altaica temon Hodgson, 1857. Alpine Weasel.

1857. *Mustela temon* Hodgson, J. Asiat. Soc. Bengal, 26: 207. Sikkim (Cotype Adult ♂ B. M. No. 58.6.24.115).

COLLECTING CENTRE (No. of Specimen): Gilgit, Azad Kashmir (1).

HABITAT: Dry temperate forests.

Genus *VORMELA* Blasius, 1884.

Vormela peregusna alpherakii Birula, 1910. Marbled Polecat.

1910. *Vormela sarmatica alpherakii* Birula, Ann. Mus. Zool. St. Petersb. 15: 333. Transcaspia, near Ashabad (Type not known).

COLLECTING CENTRES (No. of Specimens): Quetta (2), Chaman near Khojak pass in Baluchistan (1)-West Pakistan.

HABITAT: Sub-tropical dry evergreen forests.

Skull measurements (in mm.) of the specimens of *Mustela* spp. and *Vormela* sp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
M. erminea ferghanae					
94.9.2.2, ♂, Mt. Kara Karyk, E. Russian Turkistan-*Type* ...	34.0	17.9	8.4	7.6	18.3
8.10.3.1, ♂, Kaghan Valley, West Pakistan-*Type* ...	41.8	...	8.6	8.6	22.7
8.10.3.2, ♀, Kaghan Valley, West Pakistan ...	35.7	19.0	7.7	7.0	18.4
12.11.26.2, ♂, Kaghan Valley, West Pakistan ...	42.8	23.7	8.4	9.3	23.6

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
12.11.26.3 ♂, Kaghan Valley, West Pakistan ...	...	...	...	8.9	22.1
12.11.26.4, ♂, Kaghan Valley, West Pakistan ...	40.0	...	11.0	9.0	22.2
12.11.26.6, ♀, Kaghan Valley, West Pakistan ...	36.4	19.2	7.5	7.3	18.6
12.11.26.8, (?) Kaghan Valley, West Pakistan ...	...	...	6.7	7.1	15.6
Average ...	38.5	19.9	8.3	8.1	20.2
M. altaica temon					
58.6.24.115, ♂, Sikkim *Cotype* ...	48.8	25.2	10.3	10.0	28.3
1.8.4.7, ♀, Gilgit, Azad Kashmir ...	44.8	22.8	9.2	9.1	24.8
23.9.1.121, ♀, Pattan Valley, Lahul, Punjab ...	44.4	23.0	9.5	8.9	23.4
V. Peregusna elpherakii					
5.11.29.1, (?) Quetta, West Pakistan	49.1	29.9	12.5	12.6	33.1
69.8.24.1, ♀, Quetta, West Pakistan	53.4	31.6	12.7	13.4	33.2
98.7.11.1, ♀, Chaman, near Khojak Pass, West Pakistan ...	51.1	29.8	12.2	13.4	33.8

Subfamily Mellivorinae

Genus *MELLIVORA* Storr, 1780.

KEY TO THE SPECIES

1. Coat much thicker and longer; heel hairy (Probably only in winter). .....*capensis inaurita* Hodgson.
2. Coat comparatively thin and short, heel naked. ..... *capensis indica* Kerr.

Mellivora capensis indica Kerr, 1792. Honey Badger.

1792. *Ursus indicus* Kerr, Anim. Kingdom. 188. India (Type not known).

REMARKS: According to Ellerman and Morrison-Scott (1951) the range of this species includes Sind and Bengal. There is no specimen from Sind (West Pakistan) or Bengal (East Pakistan) in the B. M. Collection.

Mellivora capensis inaurita Hodgson, 1836.

1836. *Ursitaxus inauritus* Hodgson, Asiat. Res. 19. 1: 61. Muckwanpur, in foothills of Southern Nepal (Type (?) B. M. No. 45.1.8.251-not seen).

COLLECTING CENTRE (No. of Specimen): North West Frontier Province (West Pakistan) (1).

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

Sub-family Melinae

Genus *ARCTONYX* F. Cuvier, 1825.

Arctonyx collaris collaris F. Cuvier, 1825. Hog-Badger.

1825. *Arctonyx collaris* F. Cuvier, H. N. Mamm. 3, Pt. 51, pl. and text. Bhutan Duars, Eastern Himalayan (Type Paris Museum).

1856. *Arctonyx isonyx* Horsfield, P. Z. S. 398. Sikkiam Terai (Type adult (?) B. M. No. 79.11.21.272; skin good condition, skull-none).

REMARKS: There is one skin with skull in the B. M. Collection presented by the East India Company and said to be from Chittagong, but its occurrence in this part of East Pakistan is doubtful.

Skull measurements (in mm.) of the specimens of *Mellivora* sp. and *Arctonyx* sp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
M. capensis inauritus					
45.5.15.6, (?) N. W. Frontier Province ...	124.6	72.3	30.3	29.0	81.2
A. collaris collaris					
42.4.29.54, ♀, Probably from Chittagong ...	114.5	62.0	24.3	21.9	82.1
A. collaris consul					
206b, (?), Bengal ...	149.0	93.8	36.2	21.5	108.7

Sub-family Lutrinae

KEY TO THE GENERA

1. Paws comparatively large, digits extensively webbed and armed with well developed claws, ...*Lutra* Brisson.
2. Paws comparatively small, digits with less extensive webs and armed with minute claws.
   Upper lip, chin, throat and cheeks grey and nearly white.
   .....*Aonyx* Lesson.

Genus *LUTRA* Brisson, 1762.

KEY TO THE SPECIES

1. Coat rough and long haired; under fur lighter than the dorsal; teeth smaller; skull depressed, orbit smaller, muzzle longer with the anterior nares opening obliquely upwards and forwards. .....*lutra kutab* Schinz.

2. Coat smooth-haired; teeth larger; skull higher, orbit larger, muzzle shorter with the plan of the anterior nares more vertical.

(*i*) Coat blackish to rufous chocolate-brown. .....*perspicillata perspicillata* I. Geoffroy.

(*ii*) Coat sandy brown or a little paler. .....*perspicillata sindica*, Pocock.

Sub-genus *Lutra* Brisson, 1762.

Lutra lutra kutab Schins, 1844. Common Otter.

1844. *Lutra kutab* Schinz, Syn. Mamm. 354. Kashmir (Type not known).

COLLECTING CENTRE (No. of Specimen): Gilgit, Azad Kashmir (1).

Lutra lutra monticola Hodgson, 1839.

1839. *Lutra monticolus* Hodgson, J. Asiat. Soc. Bengal, 8: 320. Nepal (Type B. M. No. 214. f, skull only).

REMARKS: According to Ellerman and Morrison-Scott (1951) range of this species includes Punjab, but there is no specimen from part of Punjab in West Pakistan.

Sub-genus *Lutrogale* Gray, 1865.

Lutra perspicillata sindica Pocock, 1940. Smooth-coated Indian Otter.

1940. *Lutrogale perspicillata sindica* Pocock, J. Bombay N. H. Soc. 41: 517. Chak, Sukkur district, Western Sind, India.

COLLECTING CENTRES (No. of Specimens): Bahawalpur (1), Sukkur (3), Eastern Nara (Khairpur State) (2) and River Indus (1) in West Pakistan.

Genus *AONYX* Lesson, 1827.

Sub-genus *Amblonyx* Rafinesque, 1832.

Aonyx cinerea concolor Rafinesque, 1832. Oriental Small-clawed Otter.

1832. *Amblonyx concolor* Rafinesque, Atlantic J. 1: 62. Garo Hills, Assam. (Type not known).

REMARKS: This species occur in East Pakistan, but there is no specimen in the B. M. Collection.

Skull measurements (in mm.) of the specimens of *Lutra* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
L. lutra kutab					
1.8.4.3, ♂, Gilgit, Azad Kashmir ...	119.4	...	19.1	30.6	78.2
25.6.13.3 , ♂, Kashmir ...	111.2	...	19.2	27.4	72.0
32.5.19.2, ♀ Kashmir ...	107.8	65.3	18.8	26.0	72.4
L. perspicillata sindica					
15.11.1.79, ♂, Chak, Sukkur, West Pakistan ...	103.8	63.2	22.6	24.9	...
15.11.1.80, ♂, Eastern Nara, Khairpur West Pakistan ...	114.2	67.8	24.2	27.0	76.4
15.11.1.81, ♀, Eastern Nara, Khairpur, West Pakistan ...	118.7	73.5	25.1	26.4	80.2
35.3.26.15, ♀, Sind, West Pakistan ...	114.5	70.0	23.7	27.0	74.7
86.2.1.3, (?), Sukkur, Sind, West West Pakistan ...	118.4	71.0	24.2	26.4	77.9
Average ...	113.9	69.1	23.9	26.3	77.3

Super-family FELOIDEA.

KEY TO THE FAMILIES

1. Post-palatine foramina in front of the maxillopalatine suture.
   (*a*) Feet with five toes, claws variable; Jaws and teeth less massive; auditory bulla with distinct oblique groove.
   Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{4-4}{4-4}$, $m\frac{2-2}{2-2}$=40 teeth.
   .....VIVERRIDAE.
   (*b*) Feet with four toes, claws blunt and not retractile; Jaws and teeth highly massive; auditory bulla without oblique groove.
   Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{4-4}{3-3}$, $m\frac{1-1}{1-1}$=34 teeth.
   .....HYAENIDAE.
2. Post-palatine foramina set far back on the maxillopalatine suture. Five digits in fore-paw and four in hind paw; claws curved, sharp and retractile.
   Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{3-3}{2-2}$, or $\frac{2-2}{2-2}$, $m\frac{1-1}{1-1}$ = 30 or 28 teeth.
   .....FELIDAE.

Family VIVERRIDAE

KEY TO THE SUB-FAMILIES

1. Feet terrestrial and digitigrade; hind foot hairy from heel downwards; metatarsal pads absent; two upper molars present. .....VIVERRINAE.
2. Feet scansorial and semiplantigrade; whole or greater part of hind foot naked from the heel, one upper molar present. .....PARADOXURINAE.
3. Feet with free digits and fossorial claws; two upper molars present. .....HERPESTINAE.

Sub-family Viverrinae

Genus *VIVERRICULA* Hodgson, 1838.

Characters of *Viverricula* sp.

Anterior edges of ears set close together, the forehead being narrow; muzzle short and slender; auditory bones large, their length exceeding the width across the condyles.

Viverricula indica bengalensis Gray and Hardwicke, 1830.

Small Indian Civet.

1830. *Viverra bengalensis* Gray and Hardwicke, Ill. Ind. Zool. 1: Pl. 4. Calcutta, Bengal.

COLLECTING CENTRE (No. of Specimens): Naundero (Larkana), Sind (1).

HABITAT: Tropical thorn forests.

Viverricula indica thai Kloss, 1919.

1919. *Viverricula malaccensis thai* Kloss, J. N. H. Soc. Siam, 3: 352. Prapaton, West of Bangkok, Siam (Type not known).

COLLECTING CENTRES (No. of Specimens): Chittagong, East Pakistan (2).

HABITAT: Tropical evergreen forests.

REMARKS: Specimens from Chittagong in the B. M. Collection extend its range to East Pakistan from Burma.

Sub-family Paradoxurinae

KEY TO THE GENERA

1. Coat with a definite pattern of dorsal stripes and lateral spots; palate not produced over the anterior half of mesopterygoid fossa; post-orbital area much narrower than the interorbital area. .....*Paradoxurus* Guvier and Geoffroy.
2. Coat with no pattern of stripes or spots; palate produced backwards over the fore-part of mesopterygoid fossa; post-orbital area about the same width as the interorbital.....*Paguma* Gray.

Genus PAGUMA Gray, 1831.

Paguma larvata wroughtoni Schwarz, 1913. Masked Palm Civet.

1913. *Paguma gravi wroughtoni* Schwarz, Ann. Mag. N. H. 12: 289. Gharial, near Murree, Northern Punjab, India (Type Adult ♂ 6 B. M. No. 7.11.21.12).

COLLECTING CENTRE (No. of Specimen): Gharial (Murree), West Pakistan Pakistan (1); Sopir, Kashmir (1).

HABITAT: Sub-tropical dry evergeen forests.

Skull measurements (in mm.) of the specimens of *Viverricula thai* and *Paguma wroughtoni* examined:

Brit Mus. Nos., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
V. indica thai					
26.10.8.29, ♂, Chittagong, East Pakistan ...	102.0	47.8	13.0	17.3	72.0
26.10.8.30, ♀, Chittagong, East Pakistan ...	95.5	45.5	12.5	15.8	68.6
P. larvata wroughtoni					
7.11.21.12, ♂, Gharial near Murree *Type* ...	124.0	72.0	25.3	24.1	96.2
7.11.21.11, ♀, Gharial near Murree	119.8	64.9	21.3	22.8	90.3

Sub-family Herpestinae

Genus *HERPESTES* Illiger, 1811.

KEY TO THE SPECIES

1. Skull larger, posterior chamber of bulla inflated and projecting below the anterior one; tail long, sometimes longer than head and body length; legs darker than body.....*edwards* Geoffroy.
2. Skull smaller, posterior chamber of bulla less inflated and not or hardly projecting below the anterior one; tail shorter than head and body length; legs not darker than body.
.....*auropunctatus* Hodgson.

Herpestes auropunctatus auropunctatus Hodgson, 1836.

1836. *Mangusta auropunctata* Hodgson, J. Asiat. Soc. Bengal, 5: 235. Nepal (Lectotype adult ♂ B. M. No. 43.1.12.20).

COLLECTION CENTRES (No. of Specimens): Kichagkote (1), Kaigherskote (2), Trol (1), Ganderbal (1) and Manarsbal (1)-all in Kashmir State.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

Herpestes auropunctatus pallipes, Blyth, 1845.

1845. *Mangusta pallipes* Blyth, J. Asiat. Soc. Bengal, 14: 346. Kandahar, Afghanistan (Type not known).

1864. *Herpestes persicus* Gray, P. Z. S. 554. Mohammerah, Western Persia (Cotypes Adult (?) B. M. No. 53.1.6.84 and 85).

COLLECTING CENTRES (No. of Specimens): Chakri (Salt Range) (1), Sukkur (2), Reti (1), Larkana (1), Gambat (1), Thar Parkar (8), Bohra Pir (Karachi) (1), Bagar (Indus River) (1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Herpestes edwardsi ferrugineus Blanford, 1874. Indian Grey Mongoose.

1874. *Herpestes ferrugineus* Blanford, P. Z. S. 661, Pl. 81. Larkana, Sind, India (Type-Ind. Mus. Calcutta).

1914. *Mungos mungo pallens* Ryley, J. Bombay N. H. Soc. 22: 660. Palanpur, Northern Gujerat, India (Type old ♂ B. M. No. 13.8.23.2) skull No. 13.8.23.1).

COLLECTING CENTRES (No. of Specimens): Kohat (2), Chaklala (2), Salt Range (2): Gambat (6) Sukkur (2), Rohri (1), Thar Parkar (14), Thatta (1), Sind (1); Panjgur (2), Turbat (2), Mand (2), Jebri (1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Herpestes edwardsi nyula Hodgson, 1836.

1836. *Mangusta* (*Herpestes*) *nyula* Hodgson, J. Asiat. Soc. Bengal, 5: 236. Nepal (lowlands). Cotypes Adult (?) B. M. Nos. 43.1.12.17, 18 and 19).

REMARKS: According to Ellerman and Morrison-Scott (1951) range of this sub-species includes Bengal. There is no specimen from East Pakistan in the B. M. Collection.

Skull measurements (in mm.) of the specimens of *Herpestes* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandi-bular length
H. auropunctatus auropunctatus					
43.1.12. 20.♂, Nepal. *Lectotype* ...	61.2	29.3	10.8	10.5	40.8
8.7.6.19, ♂, Kickagkote, Kashmir ...	66.2	...	10.7	12.1	44.5
56.5.6.36, (?), Salt Range, Punjab ...	59.9	29.5	11.0	9.8	40.0
H. auropunctatus pallipes					
53.1.6.84, (?), Mohammerah, W. Persia-*Cotype* ...	...	32.7	12.5	11.5	39.2
53.1.6.85, (?), Mohammerah, W. Persia ...	61.0	32.1	9.7	11.5	41.0
15.11.1.74 ♂, Chak, Sukkur, West Pakistan ...	58,0	30.5	9.0	11.0	38.4
27.7.15.4, ♂ Reti, Sind, West Pakistan	58.3	28.4	12.9	10.7	41.2
90.4.9.1, (?), Sukkur, Sind, West Pakistan ...	...	27.5	11.1	9.6	36.8
91.7.10.22, ♂, Larkana, Sind, West Pakistan ...	54.0	28.0	9.3	9.9	36.5
Average ...	57.8	29.9	10.8	10.7	38.9
H. edwardsi ferrugineus					
13.8.23.1, ♂, Palanpur, Northern Gujerat-*Type* ...	62.1	30.4	9.8	10.0	41.2
7.6.8.2, ♀, Kohat, (North West Frontier Province), West Pakistan	73.8	37.3	12.7	13.2	51.5
15.11.1.73, ♀, Gambat, West Pakistan ...	73.5	37.4	10.3	12.7	52.6
36.7.20.58, ♀, Thatta, West Pakistan	71.5	...	12.3	13.9	50.6
56.5.6.30, (?), Salt Range, West Pakistan ...	71.1	33.0	13.6	11.5	48.8
43.139, ♂, Thar Parkar, West Pakistan	77.3	40.0	14.9	15.0	54.6
Average ...	71.5	35.8	12.3	12.7	49.9

Family HYAENIDAE

Genus *HYAENA* Brisson, 1762

Characters of *Hyaena hyaena*:

Long crest-like mane extending from head to the root of tail, vertical dark stripes on the body and transverse bars on the upper parts of legs.

Hyaena hyaena hyaena Linnaeus, 1758. Striped Hyaena.

1758. *Canis hyaena* Linnaeus, Syst. Nat. 10th ed. 1 : 40. Benna Mountains. Laristan, Southern Persia (Type not known).

COLLECTING CENTRES (No. of Specimens): Gambat (1), Kotdiji (Khairpur) (1) and Sind (1)-West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Hyaena hyaena* examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
34.11.28.6, ♀, Bhuj, Cutch, India ...	200.0	146.0	42.0	51.0	155.0
34.11.28.10, ♀, Gambat, Khairpur, West Pakistan ...	206.0	147.0	44.0	51.0	156.0
34.11.28.16, ♂, Kotdiji, Khairpur, West Pakistan ...	212.0	164.0	50.0	56.0	159.0
85.6.13.1, (?), Sind, West Pakistan...	204.0	155.0	47.0	53.0	171.0
Average ...	205.5	153.0	45.7	52.7	160.2

Family FELIDAE

KEY TO THE GENERA

1. Paws with more or less well developed cutaneous lobes constituting sheaths for the claws; a prominent sagittal crest present.
   (*i*) outer chamber of bulla comparatively or very large, the partition rising some distance from the orifice. .....*Felis* Linnaeus.
   (*ii*) outer chamber of bulla smaller, the partition rising close to the orifice. .....*Panthera* Oken.
2. Paws without traces of the cutaneous lobes; no trace of saggital crest. .....*Acinonyx* Brookes.

Genus *FELIS* Linnaeus, 1758.

KEY TO THE SPECIES

1. Outer chamber of auditory bulla small, the partition rising close to the orifice.
   (*a*) Tail over half the head and body length; sagittal crest small, postorbital area wider than the muzzle in front. .....*bengalensis* Kerr.

(*b*) Tail less than half the head and body length; sagittal crest high, postorbital area narrower than the muzzle in front. .....*viverrina* Bennett.

2. Outer chamber of auditory bulla very large, the partition rising some distance from the orifice.

(A) Inner chamber of bulla broader in front, skull narrower, mastoid width seldom as much as half the condylobasal length.

(*i*) Ear often tufted; nasal branch of premaxilla broad.

(*a*) Tail more than half the head and body length; pattern on fur of dorsal stripes and lateral spots conspicuous; zygomatic arches broad.....*libyca ornata* Gray.

(*b*) Tail less than half the head and body length; pattern on fur in adults obsolete dorsally, at most faint on the flanks; zygomatic arches narrower. .....*chaus* Guldenstaedt.

(*ii*) A long erect tuft on the ear present; nasal branch of premaxilla slender and long.

(*a*) Cheek-ruff absent; external pterygoid crest a posterior triangular spike.....*caracal* Schreber.

(*b*) Cheek-ruff present; external pterygoid crest obsolete. .....*lynx* Linnaeus.

(B) Inner chamber of bulla narrower in front; skull broader, mastoid width more than half the condylobasal length; ears set laterally and separated by a very wide area of the crown. .....*manul* Pallas.

Sub-genus *Felis* Linnaeus, 1758.

Felis libyca ornata Gray, 1830. Indian Desert Cat.

1830. *Felia ornata* Gray, Illustr. Ind. Zool. 1, pl. 2. India (Type Adult (?) B. M. No. 48.8.14.3 f. skin, skull No. 48.9.12.4).

COLLECTING CENTRES (No. of Specimens): Islam Kot (1), Chakro (3) and Umarkot (2)-all in Thar Parkar district, Thar Parkar (17), Gambat (1), Jacobabad (1), Rohtas (Salt Range) (1) and Salt Range(1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Felis chaus chaus Guldenstaedt, 1776. Jungle Cat.

1776. *Felis chaus* Guldenstaedt, Nov. Com. Acad. Petrop. 20: 483. Terek River, north of the Caucasus (Type-not known).

COLLECTING CENTRE (No. of Specimen:) Bampur (South of Jebel Bariz Range), Baluchistan (1).

HABITAT: Tropical thorn forests.

Fellis chaus kutas Pearson, 1832.

1832. *Felis kutas* Pearson, J. Asiat. Soc. Bengal, 1: 75. Midnapore, Bengal (Type not known).

COLLECTING CENTRES (No. of Specimens): Toupi (North-west Punjab) (1), Jhelum (North Punjab) (1), Salt Range (Punjab) (2)-all in West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: Specimens from West Pakistan in the B. M. Collection extend its range previously recorded (Ellerman and Morrison-Scott 1951) from Cutch to Punjab (West Pakistan).

Felis chaus prateri Pocock, 1939.

1939. *Felis chaus prateri* Pocock, Fauna Brit. India, Mamm. 1: 298. Jacobabad, Sind, Western India (Type Adult ♂, B. M. No. 32.2.1.67).

COLLECTING CENTRES (No. of Specimens): Jacobabad (3), Umarkot (11), Naundero (2), Panoaqil (2), Chachro (3), Thar Parkar (24), Gholam (1) and Karachi (1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Sub-genus *Otocolobus* Brandt, 1841.

Felis manul ferruginea Ognev, 1929. Pallas' Cat.

1929. *Otocolobus manul ferrugineus* Ognev, C. R. Acad. Sci. U. R.S.S. 308. Mountain ridge of Misssanev, Kopet-Dag Mountains, Transcaspia (Type not known).

COLLECTING CENTRE (No. of Specimen): Peshawar, West Pakistan (1).

REMARKS: One skin, presented by Ch. Musters to the B. M. was bought in Peshawar Market. Either this species actually inhabits the areas round about Peshawar or it was collected from Afghanistan and brought for sale in Peshawar. It is necessary to have more specimens to establish its range.

Sub-genus *Lynx* Kerr, 1792.

Felis lynx isabellina Blyth, 1847. European Lynx.

1847. *Felis isabellina* Blyth, J. Asiat. Soc. Bengal, 16: 1178. Tibet (Cotypes-Ind. Mus. Calcutta Nos. e and f of Sclater's Catalogue).

1904. *Felis lynx wardi* Lydekker, The Field, 104: 576. Altai Mountains (Type Adult (?) B. M. No. 4.10.14.1, skull-none).

COLLECTING CENTRES (No. of Specimens): Gilgit, Azad Kashmir (5) and Yassin (1)-Kashmir.

HABITAT: Dry temperate forests.

Sub-genus *Caracal* Gray, 1843.

Felis caracal schmitzi Matschis, 1912. Caracal Lynx.

1912. *Felis* (*Caracal*) *caracal schmitzi* Natschie, S. B. Ges. Nat. Fr. Berlin, 64. The Dead Sea region Palestine (Type not known).

COLLECTING CENTRE (No. of Specimen): Bampur, Baluchistan (1).

HABITAT: Tropical thorn forests.

Sub-genus *Prionailurus* Severtzov, 1858.

Felis bengalensis trevelyani Pocock, 1939. Leopard Cat.

1939. *Prionailurus bengalensis trevelyani* Pocock, Fauna Brit. India, Mamm. 1: 273. Near Gilgit (Type ♂ B. M. No. 32.4.9.2).

COLLECTING CENTRES (No. of Specimens): Gilgit (2), Kotli (1), Chilas (1)-Azad Kashmir; Las Bela territory (Baluchistan) (1) West Pakistan.

HABITAT: Dry temperate, sub-tropical dry evergreen and tropical thorn forests.

Felis viverrina Bennett, 1833. Fishing Cat.

1833. *Felis viverrinus* Bennett, P.Z.S. 68. India, Probably the Malabar coast (Type not known).

1967. *Viverriceps bennettii* Gray, P.Z.S. 268. India (Type Adult (?) B. M. No. 55.12.24.252).

COLLECTING CENTRES (No. of Specimens): Mirpore (Sind) (1) and Sind (1)-West Pakistan.

REMARKS: There is no specimen from East Pakistan in the B. M. Collection.

Skull measurements (in mm.) of the specimens of *Felis* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
F. libyca ornata					
48.9.12.4, (?)-*Type* ...	...	65.9	31.7	23.2	62.0
15.11.1.69, ♂, Gambat, West Pakistan ...	87.0	66.9	31.8	23.4	62.3
15.11.1.69*a*, ♀, Jacobabad, West Pakistan ...	83.0	62.4	31.1	22.2	59.0

Brit. Mus. No. Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
43.117, ♀, Thar Parkar, West Pakistan ...	70.0	53.7	30.8	19.2	51.5
43.118, (?), Thar Parkar, West Pakistan ...	78.7	58.8	30.8	21.6	57.0
43.121, ♀, Umarkot, West Pakistan...	75.0	56.5	32.6	20.0	52.6
43.135*a*, ♀, Thar Parkar, West Pakistan ...	70.6	...	32.2	19.9	49.2
Average ...	77.4	60.7	31.5	21.3	56.2
F. chaus prateri					
32.2.1.67, ♂, Jacobabad, Sind-*Type*	107.9	78.3	35.0	28.3	81.0
15.11.1.67, ♂, Jacobabad, West Pakistan	105.0	81.0	34.7	29.8	78.3
99.11.10.1, (?), Karachi, West Pakistan ...	99.0	74.9	34.1	27.6	74.6
43.67, ♂, Umarkot, West Pakistan ...	102.0	78.8	35.3	28.0	74.1
43.73, ♂, Umarkot, West Pakistan ...	106.5	74.0	35.1	26.6	78.4
43.99, ♂, Chachro, Sind, West Pakistan ...	104.5	77.0	37.8	27.0	76.8
Average ...	104.1	77.3	35.3	27.9	77.2
F. lynx isabellina					
30.5.1.1, (?), Nagar, Gilgit, Azad Kashmir ...	98.2	79.1	43.3	30.7	75.0
98.8.5.1, (?), Tibet ...	133.0	106.1	43.0	40.5	100.5
F. caracal schmitzi					
12.6.27.13, ♂, Dhomsa, Cutch, India	116.0	83.0	29.0	32.5	88.0
53.1.6.87, ♂, Dizful, Persia ...	109.0	78.0	...	30.0	80.2
F. bengalensis trevelyani					
32.4.9.2, ♂, Near Gilgit-*Type* ...	80.7	59.0	28.9	24.5	57.1
23.11.4.11, ♂, Kotli, Murree, West Pakistan ...	81.8	61.5	28.0	24.2	60.0
33.11.10.1, (?), Chilas, Kashmir ...	77.5	54.5	29.0	22.5	53.8
39.855, (?), Dalhousie, Punjab ...	88.3	68.0	28.8	26.5	63.7
Average ...	82.1	60.7	28.7	24.4	58.6
F. viverrina					
55.12.24.252, (?), India-*Type* ...	...	89.9	37.0	34.1	94.4

Genus *PANTHERA* Oken, 1816.

KEY TO THE SPECIES

1. Size smaller, pattern on fur consisting mainly of irregularly arranged rosettes, no ruff on checks; skull size about 9 inches long, nasals not projecting beyond maxillae.
   (*a*) Rosettes composed of from three to five spots in a ring. .....*pardus* Linn.
      (*i*) General colour of coat bright golden to ochraceous or orangetawny, darker on back.....*P. fusca* Meyer.
      (*ii*) General colour paler, the tint being grey with a sandy wash on the dorsal area.....*p. saxicolor* Pocock.
      (*iii*) General colour of coat intermediate between the above two races, being brighter in pattern and hue than sexicolor. .....*p. sindica* Pocock.
      (*iv*) General colour of coat dull dark buffy-grey without any bright hue in the pelage.....*p. millardi* Pocock.
   (*b*) Rosette irregular with dark centres and two or three coalesce forming elongated blotches; back of ears black. .....*uncia* Schreber.
2. Size larger, pattern on fur consisting of vertical black stripes with at most a few faint spots, ruff on cheeks present; skull size about 13 to 15 inches long, nasals projecting beyond maxillae. .....*tigris* Linnaeus.

Sub-genus *Panthera* Oken, 1816.

Panthera pardus fusca Meyer, 1794. Leopard.

1794. *Felis fusca* Meyer, Zool. Ann. 1: 394. Bengal (Type not known).

COLLECTING CENTRES (No. of Specimens): Poonch (Azad Kashmir) (1), Ashkota (1), Nasai near Srinagar (1), and Kashmir (1)-all in Kashmir State.

HABITAT: Sub-tropical dry evergreen forests.

Panthera pardus saxicolor Pocock, 1927.

1927. *Panthera pardus saxicolor* Pocock, Ann. Mag. N. H. 20: 213. Asterabad, Persia (Type Adult (?) B. M. No. 82.11.3.4).

COLLECTING CENTRES (No. of Specimens): Kushnob (Ziarat) (1), Sambaza (Baluchistan) (1), Persio-Baluchistan border (1).

HABITAT: Tropical thorn forests.

Panthera pardus sindica Pocock, 1930.

1930. *Panthera pardus sindica* Pocock, J. Bombay N. H. Soc. 34: 80. Kirther range, Sind-Baluchistan border (Type Adult ♂, B. M. No. 91.10.7.8).

COLLECTING CENTRE (No. of Specimen): Razmak (S. Waziristan), West Pakistan (1).

HABITAT: Tropical thorn forests.

Panthera pardus millardi Pocock, 1930.

1930. *Panthera pardus millardi* Pocock, J. Bombay N. H. Soc. 34: 316, Pl. 8. Kashmir (Type Adult ♀ B. M. No. 25.1.3.2.).

COLLECTING CENTRE (No. of Specimen): Kashmir State (1).

HABITAT: Dry temperate forests.

Sub-genus *Tigris* Oken, 1816.

Panthera tigris tigris Linnaeus, 1758. Tiger.

1758. *Felis tigris* Linnaeus, Syst. Nat. 10th ed. 1: 41. Bengal (Type not known).

COLLECTING CENTRE (No. of Specimens): Bengal (1), Assam (1).

HABITAT: Tropical evergreen and tidal forests.

Sub-genus *Uncia* Gray, 1854.

Panthera uncia Schreber, 1776. Snow Leopard.

1776. *Felis uncia* Schreber, Sadgeth, 3: Pl. 100 (1776) and text, 386, 586 (1777). Locality unknown (Type not known).

COLLECTING CENTRES (No. of Specimens): Gilgit (1), Ghozi area (Gilgit) (1), Pekora Nullah, Gilgit (1), Hunza (1), Sintola (1), Himalaya (1), Kashmir (2).

HABITAT: Dry temperate forests.

Skull measurements (in mm.) of the specimens of *Panthera* spp. examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
P. p. fusca					
25.4.21.1, (?), Nasai near Srinagar, Kashmir ...	181.0	128.0	43.0	50.0	131.0
25.6.31.1, ♂, Ashkote, Kashmir ...	219.0	159.0	40.0	64.0	155.0
25.12.5.1, (?), Shadipore near Ripore, Kashmir ...	211.0	...	48.0	57.0	152.0
32.5.19.1, (?), Kashmir ...	178.0	126.0	45.0	48.0	136.0
Average ...	197.2	137.6	44.0	54.7	143.5

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic width	Post-orbital width	Maxillary width	Mandibular length
P. p. saxicolor					
82.11.3.4, (?) Asterabad, Persia-*Type*	201	140	44	54	147
P. p. sindica					
91.10.7.8, ♂ Kirthar range, *Type* ...	...	...	47	55	143
P. p. millardi					
25.1.3.2, ♀, Kashmir-*Type* ...	186	136	44	52	142
P. uncia					
30.3.3.7, (?), Kashmir ...	149.0	110.0	51.0	51.0	...
32.8.21.1, ♀, Ghizar, Gilgit ...	161.0	120.0	50.0	47.0	119.0
32.8.21.2, ♂, Hunza, Gilgit ...	171.0	127.0	49.0	52.0	128.0
33.7.20.2, ♀, Pekora Nullah, Gilgit	159.0	126.0	49.0	49.0	117.0
Average	160.0	120.7	49.7	49.7	121.3

Order PROBOSCIDEA.

General Characters:

Mammals with upper lip and nose produced to form a trunk; skull large, high and its greater portion formed of cancellous tissue; upper incisors form conical tusks in males.

Dental formula: $i\frac{1-1}{0-0}$, $c\frac{0}{0}$, $m\frac{6-6}{6-6}$=26 teeth.

Family ELEPHANTIDAE

Genus *ELEPHAS* Linnaeus, 1758.

Characters of *E. maximus indicus:*

Skin nearly naked; tail with a tuft of hairs round the tip; colour uniformly dark grey; occipital condyles very prominent.

Elephas maximus indicus G. Cuvier, 1797. Indian Elephant.

1797. *Elephas indicus* Cuvier, Tabl. Elem. H. N. 148. India (Type not known).

REMARKS: There is no specimen of this species in the B. M. (N. H.) collection from Pakistan, although, according to Ellerman, and Morrison-Scott (1951) its range includes East Pakistan.

Order PERISSODACTYLA.

General Characters:

Hoofed mammals with either one or three digits in each foot (except

Tapirs), where the third or middle digit highly developed and functional; premolars and molars form a continuous series; crown of last lower molar bilobed.

KEY TO THE FAMILIES

1. Three functional digits in each foot; incisors variable in number.

Dental formula: $i\frac{2(4)}{2(4)}$, $c\frac{0}{0}$, $pm\frac{4-4}{4-4}$, $m\frac{3-3}{3-3}$

.....*Rhinocerotidae.*

2. One functional digit in each foot; premolars and molars hypsodant with flat rectangular crowns.

Dental formula: $i\frac{6}{6}$, $c\frac{1-1}{1-1}$, $pm\frac{3-3}{3-3}$, $m\frac{3-3}{3-3}$=40 teeth.

.....*Equidae.*

Sub-order CERATOMORPHA.

Family RHINOCEROTIDAE

KEY TO THE GENERA

1. A single horn on nose.
   (*a*) Fold in front of shoulder continued over back of neck; skin of sides divided into small polygonal scales.
   .....*Rhinoceros sondaicus.*
2. Two horns on nose.
   Skull broader and tooth-row longer. *Didermocerus sumatrensis lasiotis.*

Genus *RHINOCEROS* Linnaeus, 1758.

Rhinoceros sondaicus Desmarest, 1822. Lesser One-horned Rhinoceros.

1822. *Rhinoceros sondaicus* Desmarest, Mammalogie, 2: 399. Java (Type not known).

Genus *DIDERMOCERUS* Brookes, 1828.

Didermocerus sumatrensis lasiotis Buckland, 1872. Asiatic Two-horned Rhinoceros.

1871. *Rhinoceros lasiotis* Buckland, Land and Water, 10 August. (Type not known).

REMARKS: The above two species of *Rhinoceros* are now extinct in East Pakistan.

Sub-order HIPPOMORPHA

Family EQUIDAE

Genus *EQUUS* Linnaeus, 1758.

Characters of *E. hemionus khur:*

Size small about 3 ft. 10 ins. in height; hoofs narrow and under 62 mm.;

length of the suture, formed by the premaxilla and nasal, about 20 to 38 mm. (27 mm.).

Equus hemionus khur Lesson, 1827. Indian Wild Ass.

1827. *Equus khur* Lesson, Mammalogie, 347. The Little Rann of Cutch, India (Type not known).

COLLECTING CENTRE (No. of Specimen). Thar Parkar (Sind) (1).

HABITAT: Tropical thorn forest.

REMARKS: Very little is known about the present status of this species in West Pakistan (Baluchistan and Sind) but it is now considered to be rare.

Order ARTIODACTYLA.

General Characters:

Hoofed mammals with either two or four digits on all feet; third and fourth digits equal in size; premolars single lobed and the molars bi- or trilobed.

The general characters and keys to families, genera and species have been abridged from Blanford (1888-1891), Wroughton (1920) and Ellerman & Morrison-Scott (1951).

KEY TO THE SUBORDERS

1. Non-ruminant with four functional toes in each foot; upper incisors present; molars with tubercular crown (bunodont).

   Dental formula: $i\frac{3-3}{3-3}$, $c\frac{1-1}{1-1}$, $pm.\frac{4-4}{4-4}$, $m\frac{3-3}{3-3}$=44 teeth.

   .....SUIFORMES.

2. Ruminant with two functional toes in each foot (second and fifth digits being incomplete); upper incisors absent; molars with crescentic crown (selenodent); horns or antlers present at least in males.

   Dental formula: $i\frac{0-0}{3-3}$, $c\frac{0-0}{1-1}$ or $\frac{1-1}{1-1}$, $pm.\frac{3-3}{3-3}$, $m\frac{3-3}{3-3}$=32 or 34 teeth.

   .....RUMINANTIA.

Sub-order SUIFORMES.

Family SUIDAE

Genus *SUS* Linnaeus, 1758.

Sus scrofa cristatus Wagner, 1839. Wild Boar.

1839. *Sus cristatus* Wagner, Munch. Gelehrt. Anz. 9: 435. Probably the Malabar coast, India (Type not known).

REMARKS: There is no specimen of this species from Pakistan in the B. M. Collection, although East and West Pakistan are included in its range.

Sub-order RUMINANTIA.

KEY TO THE FAMILIES

1. Horns deciduous, solid, generally branched and without a core or horny sheath.....CERVIDAE.
2. Horns permanent and not branched; a corneous sheath on a bony core.....BOVIDAE.

Family CERVIDAE.

KEY TO THE GENERA

1. Horns or antlers absent even in males.
   Phalanges to lateral digits well-developed. *Moschus* Linnaeus.
2. Horns or antlers present in males.
   (*a*) Horn short on a long pedicel which forms frontal ridge; phalanges to lateral digits absent; tusk-like upper canines in males. .....*Muntiacus* Rafinesque.
   (*b*) Horn long on a short pedicel which does not form frontal ridge; phalanges to lateral digits present; upper canines, when present, not tusk-like.
      (*i*) Each horn (or antler) in adult normally with three times; tail long; coat spotted at least in summer. .....*Axis* H. Smith.
      (*ii*) Each horn (or antler) in adult normally with more than three times; tail short; coat not spotted; upper canines usually present.....*Cervus* Linnaeus.

Sub-family MOSCHINAE

Genus *MOSCHUS* Linnaeus, 1758.

Characters of *Moschus moschiferus:*

A musk-gland in front of the preputial aperture in males present; hoofs narrow and pointed and the lateral toes well developed; upper canines in both the sexes, greatly developed and projecting beyond the mouth in males.

Moschus moschiferus moschiferus Linnaeus, 1758. Musk Deer.

1758. *Moschus moschiferus* Linnaeus, Syst. Nat. 10th ed. 1: 66. "Tartary," approaching China (Type not known).

1839. *Moschus chrysogaster* Hodgson, J. Asiat. Soc. Bengal, 8: 203. Nepal (Type B. M. No. 43.1.12.93).

COLLECTING CENTRE (No. of Specimen): Gilgit, Azad Kashmir (1).

HABITAT: Dry temperate forests.

Sub-family MUNTIACINAE

Genus *MUNTIACUS* Rafinesque, 1815.

Characters of *Muntiacus muntijak vaginalis:*

Coat bright chestnut with the upper surface of tail rufous; antlers less than half the length of head; a short brow tine and the beam curved inward at the extremity.

Muntiacus muntjak vaginalis Boddaert, 1785. Indian Muntjac.

1875. *Cervus vaginalis* Boddaert, Klench, Anim. 1: 136. Bengal (Type not known).

1833. *Cervus ratwa* Hodgson, Asiatic Res. 18, 2: 139. Nepal (Lectotype. B. M. No. 43.1.12.123).

REMARKS: There is no specimen of this species from East Pakistan in the B. M. Collection, although this area is included in its range and this species is found in good number in East Pakistan.

Sub-family CERVINAE

Genus *AXIS* H. Smith, 1827.

KEY TO THE SPECIES

1. Size large, coat spotted at all seasons; brow tine meets the beam at rather less than a right angle.....*axis* Erxleben.
2. Size smaller, coat spotted in summer only; brow-tine meets the beam at an acute angle.....*porcinus* Zimm.

Sub-genus *AXIS* H. Smith, 1827.

Axis axis axis Erxleben, 1777. Chital.

1777. *Cervus axis* Erxleben, Syst. Regn. Anin. 312. Banks of the Ganges, India (Type not known).

REMARKS: There is no specimen of this species from East Pakistan in the B. M. Collection, although its range includes Bengal and they are found in good number in the Sunderbans (East Pakistan).

Sub-genus *Hyelaphus* Sundevall, 1846.

Axis porcinus porcinus Zimmermann, 1780. Hog Deer.

1780. *Cervus porcinus* Zimmermann, Geogr. Gesch. 2: 131. Bengal (Type not known).

REMARKS: There is no specimen of this species from Pakistan in the B. M. Collection, although East and West Pakistan are included in its range and this species is found in good numbers there.

Genus *CERVUS* Linnaeus, 1758.

Cervus elaphus hanglu Wagner, 1844. Hangul.

1844. *Cervus hanglu* Wagner, Schrob. Saugeth. Suppl. 4 : 352 Kashmir (Type not known).

1868. *Cervus cashmeerianus* Falconer, Palacont. Mem. 1: 576. Kashmir (Type B. M. No. 46.8.24.2).

COLLECTING CENTRES (No. of Specimens): Liddar valley (2), Kashmir valley (1), Kashmir (1)-all in Kashmir.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

Family BOVIDAE

KEY TO THE GENERA

1. Horns with prominent rings at subequal intervals, bony-core solid.
   (*i*) Horns in adult much longer than the head; spiralin shape; females hornless; no white streak on the face. .....*Antilope* Pallas.
   (*ii*) Horns in adult scarcely longer than the head; not spiral; females sometimes with horn; a white streak on each side of face prominent.....*Gazella* Blainville.
2. Horns smooth or closely, irregularly and transversely wrinkled; bony-core honey-combed with air spaces.
   (*a*) Horns inserted not close together on skull; of small size; circular in section and directed straight back over the head; present in both sexes.
      (*i*) Form large; suborbital glands present; lachrymal pits in skull well-marked.....*Capricornis* Ogilby.
      (*ii*) Form smaller; suborbital glands absent; lachrymal pits in skull absent.....*Naemorhedus* H. Smith.
   (*b*) Horns inserted very close together on skull: larger in males and like spikes in females.
      (*i*) Horn curved at the sides of head in circular or spiral curve; males inodorous.....*Ovis* Linnaeus.
      (*ii*) Horns ascending spiral or scimitar-shaped: males odorous .....*Capra* Linnaeus.

Sub-family ANTILOPINAE

Genus *ANTILOPE* Pallas, 1766.

Antilope cervicapra rajputanae Zukowsky, 1927. Black Buck.

1927. *Antilope rajputanae* Zukowsky; in Hagenbeck, Illustr. Tier. U. Menschenwelt, 2: 125. Neigbourhood of Bahawalpur, borders of Rajputana and Punjab. (Type not known).

REMARKS: There is no specimen of this species from West Pakistan in the B. M. Collection although they are found in good numbers there.

Genus *GAZELLA* Blainville, 1816.

Gazella gazella bennetti Sykes, 1831. Chinkara.

1831. *Antilope bennettii* Sykes P.Z.S. 1830-31: 104. Deccan, India (Type not known; cotypes B. M. Nos. 42.8.6.9. and 10).

1842. *Gazella christii* Blyth, J. Asiat. Soc. Bengal, 11: 452. Thar (or Indian Desert), India. (Type B. M. No. 617a, horns of ♂ only).

COLLECTION CENTRES (No. of Specimens): Ara (Salt Range) (1), Gambat (2), Sukkur (1), Sind (1), Gumasgi (West of Turbat) and Gajar Onashkai (Kalat) (1)-all in West Pakistan.

Sub-family CAPRINAE

Genus *CAPRICORNIS* Ogilby, 1837.

Characters of *Capricornis humei:*

Head pale chocolate-brown, hocks and legs below the knee white or fawn; cheek-teeth smaller, palate wide and the frontals and nasals convex.

Capricornis sumatraensis humei Pocock, 1908. Serow.

1908. *Capricornis sumatraensis* humei Pocock, P. Z. S. 178. Kashmir (Type B. M. No. 91.8.7.65).

COLLECTING CENTRE (No. of Specimens): Pir Panjal area, Kashmir (2).

HABITAT: Dry temperate forests.

Genus *NAEMORHEDUS* H. Smith, 1827.

Characters of *Naemorhedus goral:*

Coat grey to fawn-grey more or less tinged with black; black stripe on fore legs extending over the middle of carpus; tail black at the free end.

Naemorhedus goral goral Hardwicke, 1825. Goral.

1825. *Antilope goral* Hardwicke, Trans. Linn. Soc. London, 14: 518. Nepal, Himalaya (Type not known).

1905. *Urotragus bedfordi* Lydekker, Zoologist, 9: 83. Probably Dharmsala, Himalaya (Type B. M. No. 97.4.3.1).

COLLECTING CENTRES (No. of Specimens): Himalaya (Punjab) (1); Kathsi Nullah and Kaj-c-nag in West Kashmir (1).

HABITAT: Sub-tropical dry evergreen and dry temperate forests.

Genus *CAPRA* Linnaeus, 1758.

KEY TO THE SPECIES

1. Horns scimitar-shaped; beard long and restricted to the chin.
   (*i*) Anterior surface of horn laterally compressed to form a sharp anterior keel; white wrist marks present. .....*hircus* Linnaeus.
   (*ii*) Anterior surface of horn relatively flat and with evenly spaced cross ridges or knots; white wrist marks absent. .....*ibex* Linnaeus.
2. Horns twisted either like a screw or in an open spiral. .....*falconeri* Wagner.
   (*i*) Horns with one or two turns of spiral; spiral less open. .....*f. cashmiriensis* Lydekker.
   (*ii*) Horns with open spiral.....*f. chialtanensis* Lydekker.
   (*iii*) Horns conical with the anterior and posterior keels wound spirally round the curve to form two or three complete turns of the spiral.....*f. jerdoni* Hume.

Sub-genus *Capra* Linnaeus, 1758

Capra hircus blythi Hume, 1875. Sind Ibex.

1875. *Capra blythi* Hume, Proc. Asiat. Soc. Bengal, 1874: 240. Sind, India (Type B. M. No. 12.10.31.62).

COLLECTING CENTRE (No. of Specimens): Kirthar Range, West of Ghaibi Dero, Larkana and Makran Hills (Baluchistan), West Pakistan (1).

HABITAT: Tropical thorn forests.

Capra ibex sibirica Pallas, 1776. Siberian Ibex.

1776. *Ibex sibirica* Pallas, Spic. Zool. 11: 52 Northern slope of Sayan Mountains, West of Lake Baikal, Siberia (Type not known).

1900. *Capra sibirica wardi* Lydekker, Great and Small Game of India, 101. Braldu, Baltistan, Kashmir (Type, B. M. No. 0.6.25.1).

COLLECTING CENTRES (No. of Specimens): Gilgit (1), South flanks of Nanga Purbat, (Baltistan), Kashmir (2), Sishart Nullah, north of Gurais (Kashmir) (1).

HABITAT: Dry temperate forests.

Sub-genus *Orthaegoceros* Trouessart, 1905.

Capra falconeri cashmiriensis Lydekker, 1898. Markhor.

1898. *Capra falconeri cashmiriensis* Lydekker, Wild Oxen, Sheep and Goats, 290. Pir Panjal Range, Kashmir (Lectotype B. M. No. 12.10.31.54).

COLLECTING CENTRE (No. of Specimen): Chitral, West Pakistan (1).

HABITAT: Dry temperate forests.

REMARKS: They are now very few in number in Pakistan.

Capra falconeri jerdoni Hume, 1875.

1875. *Capra jerdoni* Hume, Proc. Asiat. Soc. Bengal, 1874: 240. Suleman Range, Trans-Indus district of Punjab (Lectotype B. M. No. 12.10.31.52).

COLLECTING CENTRE (No. of Specimen): Dera Ismail Khan and Sheikh Budin, Punjab, West Pakistan (1).

HABITAT: Sub-tropical dry evergreen forests.

REMARKS: These are very few in number in Pakistan.

Capra falconeri chialtanensis Lydekker, 1913.

1913. *Capra falconeri chialtanensis* Lydekker, Cat. Ungulate Mamm. B. M. 1: 171. The Chialtan Range, near Quetta, Baluchistan (Type B. M. No. 13.3.15.1).

COLLECTING CENTRE (No. of Specimen): Pishin (Baluchistan), West Pakistan (1).

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

Genus *OVIS* Linnaeus, 1758.

KEY TO THE SPECIES

1. Size large, 46-48 inches high at shoulder; tips of horns distinctly everted. Horns slender, form an open and outwardly extended spiral.
   .....*ammon polii* Blyth.
2. Size smaller, 32-36 inches high at shoulder; tips of horns turning mainly inwards.
   (*a*) Horns curve nearly in one plane and tend to form a circle.
      (*i*) Form large reaching about 36 inches at shoulder; black ruff small.....*orientalis vignei* Blyth.
      (*ii*) Form smaller reaching about 32 inches at shoulder; black ruff well developed; coat a little redder.
      .....*orientalis punjabiensis* Lydekker.
   (*b*) Horns tend to turn outwards at tips to form open spiral; the front angles prominent showing beaded structure.
   .....*orientalis blanfordi* Hume.

Ovis ammon polii Blyth, 1841. Marcopolo's Sheep.

1841. *Ovis polii* Blyth, P.Z.S. 1840. 62: Near sources of the Syr Daria, Pamir Plateau, Russian Turkestan (Type B. M. No. 79.11.21.20).

REMARKS: This species is reported to enter the Hunza area in Azad Kashmir. There is no specimen from Hunza in the B. M. Collection.

Ovis orientalis vignei Blyth, 1841. Urial.

1841. *Ovis vignei* Blyth, P.Z.S. 1840: 70. Astor, Kashmir (Type not known).

COLLECTING CENTRES (No. of Specimens): Bhola (Chitral) (1); Zogi-la Pass (Kashmir) (2); Ramghat (at the junction of Astor and Indus in Kashmir) (1).

HABITAT: Dry temperate forests.

Ovis orientalis blanfordi Hume, 1877.

1877. *Ovis blanfordi* Hume, J. Asiat. Soc. Bengal, 46, 2: 327, pl. 4. Hills above the Bolan Pass, near Kalat, Baluchistan (Type B. M. No. 12.10.31. 71).

COLLECTING CENTRES (No. of Specimens): Nokopi Hills (1), Gwambak Khaul (2) both near Panjgur; Turbat (1), Hodal Pass (1), Taptap (Mekran) (1).

HABITAT: Tropical thorn forests.

Ovis orientalis punjabiensis Lydekker, 1913.

1913. *Ovis vignei punjabiensis* Lydekker, Cat. Hume Bequest, 10; Salt Range, Punjab, India (Type B. M. No. 12.10.31.65).

COLLECTING CENTRES (No. of Specimens): Nib (25 miles north of Jhelum) (2); Nishapur (1), Attock Hills and Akhor Hills, Punjab (1).

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

Order LAGOMORPHA

General Characters:

Terrestrial and gnawing mammals with four incisors in the upper jaw (the two small incisors are placed behind the two large ones).

KEY TO THE FAMILIES

1. Ears long; tail present; post-orbital processes in skull present and the zygoma not prolonged posteriorly.

   Dental formula: $i\frac{2-2}{1-1}$, $c\frac{0-0}{0-0}$, pm.$\frac{3-3}{2-2}$, $m\frac{3-3}{3-3}$=28 teeth.

   .....*Laporidae.*

2. Ears short and rounded; tail absent; post-orbital processes in skull absent and the zygoma prolonged posteriorly.

   Dental formula: $i\frac{2-2}{1-1}$, $c\frac{0-0}{0-0}$, pm.$\frac{2-2}{2-2}$, $m\frac{3-3}{3-3}$=26 teeth.

   .....*Ochotonidae.*

Family LAPORIDAE

KEY TO THE GENERA

1. Ears as long as the head; tail white beneath; mesopterygoid region wider; the width of space behind palate shorter than the length of Palatal bridge (the length being less than 120% of the mesopterygoid width).
   .....*Lepus* Linn.
2. Ears shorter than the head; tail entirely brown; mesopterygoid region narrow; the width of space behind palate much shorter than the least longitudinal diameter of palatal bridge (the diameter being more than 130% of the mesopterygoid width).
   .....*Caprolagus* Blyth.

Genus *LEPUS* Linnaeus, 1758.

KEY TO THE SPECIES

1. Bullae enlarged, about 16% or more of the occipitonasal length; tail dark brown above and white below.
   .....*arabicus craspedotis* Blanford.
2. Bullae smaller, less than 16% of the occipitonasal length.
   (*a*) Palate averages shorter than mesopterygoid space or a little longer (under 110%); tail brown and white.
   .....*nigricollis dayanus* Blanford.
   (*b*) Palate normally exceeds width of mesopterygoid space; tail black and white.....*capensis tibetanus* Waterhouse.

Lepus capensis tibetanus Waterhouse, 1841. Cape Hare.

1841. *Lepus tibetanus* Waterhouse, P.Z.S. 7. Upper Indus Valley, Little Tibet (=Baltistan), Kashmir. (Type Adult (?) B. M. No. 53.8.29.25; skin in fair order, hind legs torn, skull whole underside of braincase missing).

COLLECTING CENTRES (No. of Specimens): Gilgit (Azad Kashmir) (3); Kohat (1) and Khurran Valley (2) in West Pakistan.

HABITAT: Dry temperate forests.

Lepus arabicus craspedotis Blanford, 1875. Arabian Hare.

1875. *Lepus craspedotis* Blanford, Ann. Mag. N. H. 16: 313. Pishin, Baluchistan (Type-Ind. Mus. Calcutta No. a).

COLLECTING CENTRES (No. of Specimens): Gandak near Quetta (1), Khojdar Pass (between Quetta and Candhar) (1), Panjgur (2), Sor (1)

Harbud (near Panjgur) (1), all in West Pakistan.

HABITAT: Dry temperate and tropical thorn forests.

Lepus nigricollis dayanus Blanford, 1874. Indian Hare.

1874. *Lepus dayanus* Blanford, P.Z.S. 663. Sukkur, Sind, India (Lectotype Adult (?) B. M. No. 90.4.9.3 and Cotype Adult (?) B. M. No. 90.4.9.2 by Dr. F. Day; skins and skulls complete).

COLLECTING CENTRES (No. of Specimens): Nurpur (1) and Ara (1) (Salt-Range), Jacobabad (5), Sukkur (2), Naundero (2), Hyderabad (1), Shangar (Sehwan) (1) and Kand (Hubb Valley) (2), all in West Pakistan.

HABITAT: Tropical thorn forests.

Lepus nigricollis ruficaudatus Geoffroy, 1826.

1826. *Lepus ruficaudatus* Geoffroy, Dict. Class H. N. 9: 381. Bengal (Type not known).

1840. *Lepus macrotus* Hodgson, J. Asiat. Soc. Bengal, 9: 1183. Gangetic Plain, India (Lectotype Adult (?) B. M. No. 43.1.12.39) skin in good order, skull (—) whole underside of braincase missing).

REMARKS: The range of this subspecies includes Bengal. There is no specimen from East Pakistan in the B. M. (N.H.) Collection.

Skull measurements (in mm.) of the specimens of *Lepus* species examined:

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic Breadth	Maxillary tooth-row (entire)	Mandibular tooth-row (entire)
L. capensis tibetanus				
7.6.8.5, ♀, Khurram Valley (N. W. F. Province)	79.4	40.4	44.0	...
9.6.10.10, ♂, Kohat (N. W. F. Province) ...	75.9	40.6	41.7	...
81.3.1.7, ♂, Gilgit (Azad Kashmir) ...	72.4	40.2	40.8	37.3
81.3.1.8, (?), Gilgit (Azad Kashmir) ...	73.0	39.9	41.3	...
Average ...	75.2	40.3	41.9	37.3

Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic Breadth	Maxillary tooth-row (entire)	Mandibular tooth-row (entire)
L. arabicus craspedotis				
19.11.7.86, ♂, Panjgur (Baluchistan) ...	74.2	...	42.0	39.4
19.11.7.87, ♀, Panjgur (Baluchistan) ...	77.2	...	39.0	...
19.11.7.88, ♂, Sor (near (Panjgur) Baluchistan)	70.2	38.4	38.0	35.8
19.11.7.89, ♀, Harbud (Panjgur) (Baluchistan) ...	74.7	39.9	39.1	36.0
82.8.11.1, (?), Khojak Pass (Baluchistan) ...	74.7	41.7	40.8	36.5
91.10.7.153, (?) Near Quetta (Baluchistan) ...	67.3	38.1	36.4	...
Average ...	73.0	39.5	39.2	36.9
L. nigricollis dayanus				
90.4.9.2, (?), Sukkur (Sind)-*Cotype* ...	...	38.5	42.0	36.0
90.4.9.3, (?), Sukkur (Sind)-*Lectotype* ...	72.2	37.2	40.0	34.5
8.3.9.19 (?), Kand, Hubb Valley (Sind) ...	75.8	40.0	42.4	...
15.11.1.122, ♀, Jacobabad (Sind) ...	75.7	...	41.1	37.6
15.11.1.124, ♂, Sukkur (Sind) ...	73.5	...	40.2	36.4
25.10.3.4, ♀, Nurpur (Salt Range), Punjab ...	76.8	40.2	41.8	...
91.10.7.147, ♀, Kand, Hubb Valley (Sind) ...	71.7	38.3	38.6	...
Average ...	74.3	38.8	40.9	36.1

Genus *CAPROLAGUS* Blyth, 1845.

Characters of *Caprolagus hispidus:*

No clear notch in front of postorbital processes; frontal bones very wide; bullae relatively smaller.

Caprolagus hispidus Pearson, 1839. Assam Rabbit.

1839. *Lepus hispidus* Pearson, in M'Clelland, P.Z.S. 152. Northern Assam, foot of Himalayas (Type not known).

COLLECTING CENTRE (No. of Specimens): East Bengal (1), East Pakistan.

HABITAT: Tropical evergreen forests.

Skull measurements (in mm.) of the specimens of *Caprolagus hispidus* examined:

Brit. Mus. No., Sex and Locality		Condylo-basal length	Zygomatic Breadth	Maxillary tooth-row (entire)	Mandibular tooth-row (entire)
Caprolagus hispidus					
24.6.11.1, (?), Kheri district (U.P.)	...	77.5	41.7	42.6	38.8
58.6.24.85, (?), Nepal	...	75.6	40.8	41.2	37.9
1028*b*, (?), Nepal	...	81.6	42.6	44.8	41.0
Average	...	78.2	41.7	42.8	39.2

Family OCHOTONIDAE

Genus *OCHOTONA* Link, 1795.

KEY TO THE SPECIES

Palatal and incisive foramina not distinct, but confluent.

(*a*) Ears large, rarely less than 27 mm. in length .....*macrotis macrotis* Gunther.

(*b*) Ears not large, rarely reaching 27 mm. in length

(*i*) Palatal length less than 17 mm.; hind foot not reaching 40 mm. .....*roylei wardi* Bonhote.

(*ii*) Palatal length more than 17 mm.; hind toe pads not covered by hair. .....*rufescens rufescens* Gray.

Ochotona macrotis macrotis Gunther, 1875. Large-eared Pika.

1875. *Lagomys macrotis* Gunther, Ann. Mag. N. H. 16: 231 (September). Doba, Kuenlun Mountains, extreme southern Chinese Turkestan (on road from Yarkand to Karakorum Pass, Blanford) (Cotypes B. M. Nos. 44.3.1.14 and 75.3.30.3).

COLLECTING CENTRES (No. of Specimens): Gilgit (Azad Kashmir) (1), Indus Valley (Kashmir) (1), Sanju Pass (Kashmir) (1).

HABITAT: Dry temperate forests.

Ochotona roylei wardi Bonhote, 1904. Royle's Pika.

1904. *Ochotona wardi* Bonhote, Abstr. P.Z.S. No. 10: 13.1905, P.Z.S. 1904, 2: 214. Talien (Tullian), 11000 ft. Kashmir (Type Adult ♂ B. M. No. 4. 5.6.1 by Col. Ward; skin in good order, skull in fragments).

COLLECTING CENTRES (No. of Specimens): Kaghan Valley (10) and Bogarmang glen (Hazara) (3), in West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

Ochotona rufescens rufescens Gray, 1842. Afghan Pika.

1842. *Lagomys rufescens* Gray, Ann. Mag. N. H. 10: 266. Near Babers' Tomb, Kabul, Afghanistan (Lectotoype Adult (?) B. M. No. 44.9.15.9 and Cotype Adult (?) B. M. No. 44.9.15.10; skins in good order, skull (—) in first braincase and in the second bullae missing).

COLLECTING CENTRE (No. of Specimens): Khurram Valley (N. W. F. Province) (2), Ziarat (2), Mastung (1), Bolan Pass (near Quetta) (1), all in West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

REMARKS: Ellerman and Morrison-Scott (1951) indicated the range of this subspecies to Baluchistan, but the specimens from Khurram Valley (N.W.F. Province), West Pakistan in the B. M. (N.H.) Collection establish its range to be extended to the North-western region of West Pakistan.

Skull measurements (in mm.) of the specimens of *Ochotona* species examined:

Name, Brit. Mus. No., Sex and Locality	Condylo-basal length	Zygomatic Breadth	Maxillary teeth-row (entire)	Mandibular tooth-row (entire)
O. macrotis macrotis				
1.8.4.11, ♂, Gilgit (Azad Kashmir) ...	41.0	21.8	20.2	18.5
7.9.6.16, ♀, Sanju Pass (Kashmir) ...	...	...	17.1	15.9
76.3.9.5, (?), Indus Valley (Kashmir) ...	...	20.0	18.1	16.7
Average ...	41.0	20.9	18.4	17.0
O. roylei wardi				
8.10.3.14, ♂, Kaghan Valley (Hazara) ...	...	22.3	20.3	18.6
9.11.26.7, ♂, Kaghan Valley (Hazara)	40.4	21.9	20.2	18.1
12.11.26.21, ♀, Bogarmang Glen (Hazara) ...	39.9	22.0	19.9	18.1
12.11.26.24, ♀, Kaghan Valley (Hazara) ...	...	22.3	20.1	...
12.11.26.25, ♀, Kaghan Valley (Hazara) ...	40.6	...	19.9	18.3
12.11.26.26, ♀, Kaghan Valley (Hazara) ...	39.8	21.7	19.8	18.2
Average ...	40.1	22.0	20.0	18.2
O. rufescens rufescens				
4.11.28.1, (?), Ziarat (Baluchistan) ...	42.4	...	...	18.8
6.12.2.3, (?), Kurram Valley (N. W. F. Province)	42.6	23.6	21.8	19.9
7.12.27.7, ♀, Mastung (Baluchistan) ...	...	23.1	21.4	19.5
85.8.1.345, (?), Bolan Pass (near Quetta, (N. W. F. Province) ...	...	24.2	22.3	20.8
Average ...	42.5	23.6	21.8	19.5

Order RODENTIA

General Characters:

Small gnawing mammals usually fully furred and with a single large chisel-shaped rootless incisor on each side of the jaw.

General dental formula: $i\frac{1-1}{1-1}$, $c\frac{0-0}{0-0}$, pm.$\frac{2-2}{1-1}$, m.$\frac{3-3}{3-3}$=22 teeth.

The general characters and keys to families, genera and species have been abridged from Ellerman (1941, 1947) and Ellerman and Morrison Scott (1951).

KEY TO THE SUBORDERS

1. Lower jaw highly specialized either by a conspicuous ridge along the outside of mandible or by the distortion outwards of the angular process by the masseter lateralis. Angular portion of mandible arises from the outside of the bony socket of the incisor. .....HYSTRICOGNATHI.
2. Lower jaw not highly specialized, never with the angular portion distorted outwards and never with the ridge along the outside of mandible. Angular portion of mandible arises from the lower edge of bony socket of incisors.....SCIUROGNATHI.

Sub-order HYSTRICOGNATHI.

Characters of Super-family HYSTRICOIDAE:

Infra-orbital foramen very large; inter-orbital constriction not prominent (absent in the majority); jugal not approaching lachrymal; cheek-teeth 4-4, the premolars not reduced in size in the majority.

Family HYSTRICIDAE

Genus *HYSTRIX* Linnaeus, 1758.

KEY TO THE SPECIES

1. Body covered with thick circular quills; each quill with a dark ring in the middle and white terminally and basally; no crest of hairs on head; caudal hollow rattling quills less developed. .....*hodgsoni* Gray.
2. Quills on back very long and with several alternating blackish and white rings; a well developed crest of long bristles on head present; caudal hollow rattling quills highly developed. .....*indica* Kerr.

Sub-genus *Hystrix* Linnaeus, 1758.

*Hytrix indica indic a*Kerr, 1792. Indian Crested Porcupine.

1792. *Hystrix cristata* var. *indica* Kerr, Anim. Kingd. 213. Based on Smellie's Buffon, 1781, 7: Pl. 206. India.

1831. ***Hystrix leucurus*** Sykes, P.Z.S. 103. Deccan, India (Type Adult (?)

B. M. No. 42.8.6.6, skin and skull-complete).

COLLECTING CENTRES (No. of Specimens): Datta Khel, Tochi valley (Bannu) (1), Mirwah (2), Gambat (1), Mirpur (Sukkur) (1), Khojdar (Baluchistan) (1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Sub-genus *Acanthion* Cuvier, 1823.

Hystrix hodgsoni hodgsoni Gray, 1847. Crestless Himilayan Porcupine.

1847. *Acanthion hodgsoni* Gray, P.Z.S. 101 (June, 1847). Nepal Cotypes-B. M. Nos. 45.1.8.8 and 47.7.22.9).

REMARKS: The range of this species includes Nepal and Assam, Blyth (1951) reported it from Bengal and thus there is the possibility that this species inhabits East Pakistan.

Skull measurements (in mm.) of the specimens of *Hystrix* spp. examined:

Brit. Mus. No., Sex and Locality	Occipitonasal length	Nasal length	Zygomatic width	Upper cheek teeth
H. indica indica				
42.8.6.6, (?), Deccan, India-*Type* ...	150.9	71.0	...	30.2
3.4.12.1, (?), Mirwah, Punjab West Pakistan ...	149.3	79.0	80.0	36.4
15.11.1.125, ♂, Khairpur, Sind, West Pakistan	129.4	65.5	72.0	32.2
15.11.1.127, ♀, Sukkur, Sind, West Pakistan ...	120.8	51.6	68.2	29.9
15.11.1.128, ♀, Khairpur, Sind, West Pakistan	140.2	69.0	76.7	29.7
19.11.8.34, ♀, Khojdar, Baluchistan, West Pakistan ...	145.5	73.6	82.4	35.7
Average ...	139.4	68.3	75.9	32.4
H. hodgsoni hodgsoni				
45.1.8.8, (?), Nepal-*Cotype* ...	115.5	64.2	63.0]	25.4
21.10.4.35, ♂, Nepal ...	114.3	66.0	...	26.8
79.11.21.637, (?), Nepal ...	112.7]	60.8	62.9]	24.8
Average ...	114.2	63.7	62.9	25.7

Sub-order SCIUROGNATHI.

1. Infra-orbital foramen not or scarcely open for muscle transmission; Cheek-teeth 5/4 or 4/4 (extra upper premolar small); tail fully haired.....SCIUROMORPH SERIES.
2. Infra-orbital foramen always clearly open for muscle transmission; cheek-teeth 4/3 or 3/3 (extra upper premolar small); tail not always fully haired.....MYOMORPH SERIES.

SCIUROMORPH SERIES.

Family SCIURIDAE

KEY TO THE GENERA

A. Limbs connected by a membrane.
   1. Fur excessively thick and heavy and the soles heavily haired; hind-foot about 85 mm.; cheek-teeth generally deeply imbedded and long (Hypsodont); upper molars with flat upper surface and with inner borders proximally subangulated. .....*Eupetaurus* Thomas.
   2. Fur less thick and heavy and the soles not heavily haired; hind-foot less than 85 mm.; cheek-teeth not strongly hypsodont; upper series of teeth with upper surface not flat and with inner borders rounded.
      (*i*) An interfemoral membrane attached to the bushy tail. .....*Petaurista* Link.
      (*ii*) No interfemoral membrane attached to the tail, which is not bushy. .....*Hylopetes* Thomas.

B. Limbs free, not connected by membrane.
   1. Brain flattened; heavy sagittal crest present; p^3 large and functional.
      Middle finger of hand longest; tail short less than half of head and body. .....*Marmota* Blumenbach.
   2. Brain less flattened; sagittal crest mostly absent; p^4 usually reduced or absent.
      (*i*) coronoid process of mandible low and reduced; back with light stripes.....*Funambulus* Lesson.
      (*ii*) Coronoid process of mandible not reduced; back generally not striped.
         (*a*) Skull narrow; length of nasals usually exceeds interorbital breadth. .....*Dremomys* Heude.
         (*b*) Skull wide; interorbital breadth usually exceeds nasal length. .....*Callosciurus* Gray.

Genus *PETAURISTA* Link, 1795.

Petaurista petaurista albiventer Gray, 1834. Common Giant Flying Squirrel.

1834. *Pteromys albiventer* Gray, Illustr. Ind. Zool. Pl. xviii. Type skull in B.M., labelled Nepal (Type Adult (?) B. M. No. 114c).

1911. *Petaurista birrelli* Wroughton, J. Bombay N. H. Soc. 20, 4: 1014, 1019. Murree, Hazara, Punjab (Type Adult ♀ B. M. No. 5.11.19.3).

1911. *Petaurista fulvinus* Wroughton, J. Bombay N. H. Soc. 20, 4: 1014, 1021. Simla, Punjab (Type Adult ♂, B. M. No. 85.81.121).

COLLECTING CENTRES (No. of Specimens); Sardallu (1), Pehlgam (3) and Islamabad (1), all in Kashmir; Donga gali (1), Bara gali (1) and Murree (1), all in West Pakistan.

HABITAT: Sub-tropical dry evergreen forests.

Skull measurement (in mm.) of the specimens of *Petaurista p. albiventer*.

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
114C., (?), Nepal-*Type* ...	65.4	18.8	44.5	15.3
5.11.19.3, ♀, Murree, Punjab, West Pakistan-*Type* ...	71.7	22.5	46.7	15.9
85.8.1.121, ♂, Simla, Punjab, India-*Type* ...	68.2	21.5	48.3	15.6
5.11.19.2, ♀, Bara gali, Murree Hills, West Pakistan ...	58.3	16.0	...	13.2
6.12.3.3., ♀, Pehlgam, Kashmir ...	65.4	20.2	...	13.8
6.12.3.4, ♂, Kashmir ...	63.3	18.8	44.8	15.1
6.12.3.5, (?), Kashmir ...	64.8	19.2	43.1	15.5
6.12.3.6, ♀, Kashmir ...	...	...	44.2	15.3
8.7.6.25, ♂, Kashmir ...	64.7	19.3	...	13.8
20.6.27.5, (?), Dungagali, Murree, West Pakistan	70.5	22.2	46.2	...
23.11.4.12, ♀, Murree, West Pakistan ...	69.1	19.8	45.7	...
26.10.8.60, (?), Kashmir (Lidder Valley) ...	63.3	19.3	42.6	15.0
Average ...	65.9	19.8	45.1	14.9

Genus *HYLOPETES* Thomas, 1908.

KEY TO THE SPECIES

1. Larger, occipitonasal length not less than 55.2 mm.; nasals proportionately longer, usually more than 17 mm. in length;
   (*a*) occipitonasal length (with parietal ridges separate and not approached to each other) more than 61.4 mm. .....*fimbriatus baberi* Blyth.
   (*b*) occipitonasal length (with parietal ridges approached to each other or fused) not more than 61.4 mm. .....*fimbriatus fimbriatus* Gray.
2. Smaller, occipitonasal length not exceeding 52.8 mm; nasals proportionately shorter, less than 16 mm. in length, occipitonasal length not less than 45.2 mm. on average..... .....*alboniger alboniger* Hodgson.

Sub-genus *Eoglaucomys* Howell, 1915.

Hylopetes fimbriatus fimbriatus Gray, 1837. Smaller Kashmir Flying Squirrel.

1837. *Sciuropterus fimbriatus* Gray, Ann. Mag. N. H. 1: 584. Simla, Punjab (Type Adult (?) B. M. No. 37.6.10.55).

COLLECTING CENTRES (No. of Specimens): Gilgit (1), Sardallu (3), Nasai (1) in Kashmir; Chitral (1), Murree (1), Bhurban (Murree district) (1), Thandiani (2) and Gharial (2), all in West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

Hylopetes fimbriatus baberi Blyth, 1847.

1847. *Sciuropterus baberi* Blyth, J. Asiat. Soc. Bengal, 16: 866. Mountain district of Nijrow, Kohistan, Afghanistan (Type not known).

COLLECTING CENTRES (No. of Specimens): Kaghan valley (2) and Hazara (1), West Pakistan; Kashmir (2).

HABITAT: Dry temperate forests.

REMARKS: Specimens from Kaghan Valley and Hazara in the B. M. Collections justify the inclusion of these areas of West Pakistan in its range.

Sub-genus *Hylopetes* Thomas, 1908.

Hylopetes alboniger alboniger Hodgson, 1836. Particoloured Flying Squirrel.

1836. *Sciuropterus alboniger* Hodgson, J. Asiat. Soc. Bengal, 5: 231. Nepal (Lectotype Adult ♂ B. M. No. 43.1.12.49).

COLLECTING CENTRE (No. of Specimen): Sylhet (Assam) (1), East Pakistan.

HABITAT: Tropical evergreen forests.

Skull measurements (in mm.) of the specimens of *Hylopetes* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
H. fimbriatus fimbriatus				
37.6.10.55, (?), Simla, Punjab, India-*Type* ...	55.4	17.4	...	10.6
5.11.19.4, ♀, Murree, Punjab, West Pakistan ...	58.4	18.3	...	11.7
7.8.1.2, ♂, Thandiani (Hazara) district), West Pakistan ...	54.5	17.8	32.5	11.0
7.8.1.3, ♀, Thandiani (Hazara district), West Pakistan ...	54.9	17.8	...	11.6
7.11.21.13, ♂, Gharial, Punjab, West Pakistan	55.3	18.8	33.8	11.7
81.3.1.5, ♀, Gilgit (Azad Kashmir) ...	58.0	19.6	34.8	12.0
Average ...	56.1	18.3	33.7	11.4
H. fimbriatus baberi				
12.11.26.10, ♂, Hazara (N. W. F. Province), West Pakistan ...	60.9	18.7	35.0	12.3
79.7.2.11, ♂, Kashmir ...	59.7	20.4	35.7	11.9
79.7.2.12, ♀, Kashmir ...	60.8	20.5	35.4	12.8
H. alboniger alboniger				
43.1.12.49, ♂, Nepal -*Lectotype* ...	45.0	13.8	27.7	9.4
21.1.6.56, ♂, Jantia Hills, Assam ...	47.0	14.0	29.6	10.2
21.1.6.60, ♀, Jantia Hills, Assam ...	50.3	15.0	31.5	10.5
21.12.5.41, ♂, Mishmi Hills, Assam ...	49.2	14.8	30.0	10.5
75.8.24.2, (?), Syhlet, Assam (East Pakistan) ...	46.7	15.0	...	10.2
Average ...	47.6	14.5	29.7	10.2

Genus *EUPETAURUS* Thomas, 1888.

Eupetaurus cinereus Thomas, 1888. Woolly Flying Squirrel.

1888. *Eupetaurus cinereus* Thomas, J. Asiat. Soc. Bengal, 572 (3); 258, Pls. xxii, xxiii, Gilgit Valley, Kashmir (Lectotype Adult (?) B. M. No. 88.9.28.1 from Astor, Kashmir; skin flat mounted as rug; skull-none).

COLLECTING CENTRES (No. of Species): Chitral, West Pakistan (2), Gilgit, Azad Kashmir (1). (Only skins in the collection).

HABITAT: Dry temperate forests.

Genus *CALLOSCIURUS* Gray, 1867.

KEY TO THE SUB-SPECIES OF **Callosciurus pygerythrus**

Tail tip black and a seasonal thigh patch present.

(*i*) Thigh patch, when present, red.....*lokroides* Hodgson.

(*ii*) Thigh patch, when present, white or whitish but lacking the reddish colour. .....*blythi* Tytler.

Callosciurus pygerythrus lokroides Hodgson, 1836. Irrawaddy Squirrel.

1836. *Sciurus lokroides* Hodgson, J. Asiat. Soc. Bengal, 5 ; 232. Nepal (Cotypes B. M. Nos. 43.1.12.58 and 59).

REMARKS: There are no specimens of this subspecies from East Pakistan in the B. M. Collection, although its range includes Northern Bengal.

Collosciurus pygerythrus blythi Tytler, 1854.

1854. *Sciurus blythi* Tytler, Ann. Mag. N. H. 14: 172. Dacca, Eastern Bengal (Cotypes B. M. Nos. 79.11.21.361 and 362).

REMARKS: The Type locality of this subspecies is Dacca, East Pakistan, but there is no specimen from any part of East Pakistan in the B. M. Collection.

Genus *DREMOMYS* Heude, 1898.

Dremomys lokriah macmillani Thomas, 1916. Orange-bellied Himalayan squirrel.

1916. *Dremomys macmillani* Thomas, J. Bombay N. H. Soc. 25, 2: 238. Tatkon, Western Burma (Type Adult ♂ B. M. No. 15.5.5.198).

REMARKS: The range of this subspecies according to Ellerman and Morrison-Scott (1951) indicates the likelihood of its occurrence in East Pakistan.

Genus *FUNAMBULUS* Lesson, 1835.

Characters of *Funambulus pennanti:*

Back with five light stripes; underside of tail without any reddish line.

Funambulus pennanti Wroughton, 1905. Northern Palm Squirrel.

1905. *Funambulus pennantii* Wroughton, J. Bombay N. H. Soc. 16, 3: 411. Mandvi Taluka, Suret district, Bombay Presidency, India. (Type Adult ♂ B. M. No. 98.4.2.25).

1905. *Funambulus pennantii argentescens* Wroughton, J. Bombay N. H. Soc. 16, 3: 413. Rawalpindi, Northern Punjab (Type Adult ♂ B. M. No. 5.4.2.3).

COLLECTING CENTRES (No. of Specimens): Kohat (3); Peshawar (2); Rawalpindi (10); Ara (2), Kallar Kahar (2), Choan (1) and Soohi (1)-all in Salt Range; Multan (4), Mirpur

Sakro (3), Bohara (1), Garo (1), Golam (1), Jacobabad (2), Kashmor (2), Naundero (2), Shikarpur (1), Sehwan (1), Panoaqil (5); Mand (1), Turbat (3), Gajar (2)-all in West Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Callosciurus* species and *Funambulus* species.

Brit. Mus. No., Sex and Locality		Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
C. pygerythrus lokroides					
43.1.12.58, ♀, Nepal-*Cotype*	...	48.0	14.7	28.3	9.0
43.1.12.59, (?), Nepal-*Cotype*	...	46.7	13.9	27.8	8.9
15.9.1.109, ♂, Bengal	...	49.1	14.8	28.7	9.5
15.9.1.111, ♂, Bengal	...	48.2	15.0	28.6	9.3
16.7.29.58, ♀, Bhutan Duars	...	47.9	14.1	27.5	8.8
21.10.4.12, ♂, Darjeeling, Bengal	...	48.3	14.1	29.0	9.5
88.4.4.3, ♀, Darjeeling, Bengal	...	45.2	14.6	26.4	9.0
Average	...	47.6	14.5	28.0	9.1
C. pygerythrus blythi					
20.11.1.35, ♂, Assam	...	45.6	13.2	...	9.2
20.11.1.37, ♀, Assam	...	48.4	14.6	29.1	9.2
20.11.1.42, ♀, Garo Hills, Assam	...	52.3	16.7	32.8	9.5
21.8.2.19, ♂, Naga Hills, Assam	...	47.5	14.5	28.3	9.4
Average	...	48.5	14.8	30.1	9.3
F. pennanti					
98.4.2.25, ♂, Mandvi Taluka, Surat district, Bombay-*Type*	...	37.4	11.6	21.3	6.9
5.4.2.3, ♂, Rawalpindi, West Pakistan-*Type*	...	37.2	11.4	21.4	6.9
5.4.2.2, ♂, Rawalpindi, West Pakistan	...	33.4	9.0	...	6.4
5.4.2.4, ♀, Rawalpindi, West Pakistan	...	32.8	9.3	...	6.8

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
5.4.2.5, ♀, Rawalpindi, West Pakistan ...	36.4	10.9	20.8	6.5
5.11.19.9 ♂, Rawalpindi, West Pakistan ...	37.4	11.6	21.0	6.7
5.11.19.11, ♂, Rawalpindi, West Pakistan ...	36.6	10.9	20.0	...
15.11.1.82, ♂, Jacobabad, Sind, West Pakistan ...	36.8	10.9	20.1	7.0
19.11.7.27, ♀, Turbat, Baluchistan, West Pakistan	37.0	11.5	...	6.9
23.11.3.31, ♀, Ara, Salt Range, West Pakistan	36.2	10.8	...	7.3
23.11.9.3, ♀, Mirpur Sakro, Sind, West Pakistan	34.2	10.7	20.0	7.0
Average ...	35.9	10.8	20.7	6.8

Genus *MARMOTA* Blumenbach, 1779.

KEY TO THE SPECIES

1. Tail long about more than one-third of head and body length.
   (*a*) A large dark saddle-patch on back present in both the sexes. .....*caudata caudata* Jacquemont.
   (*b*) No dark saddle-patch on back, at least in females.
      (*i*) General fur colour fulvous.....*caudata aurea* Blanford.
      (*ii*) General fur colour dark brown above and below. .....*caudata dichrous* Anderson.
2. Tail short about one-third or less of head and body length. General fur colour greyish. .....*bobak himalayana* Hodgson.

Marmota bobak himalayana Hodgson, 1841. Bobak Marmot.

1841. *Arctomys himalayanus* Hodgson, J. Asiat. Soc. Benegal. 10: 777. Nepal (Type Adult (?) B. M. No. 45.1.8.239).

REMARKS: Range of this subspecies includes Baltistan in Azad Kashmir. but there is no specimen from this area in the B. M. Collection.

Marmota caudata caudata Jacquement, 1844. Longtailed Marmot.

1844. *Arctomys caudatus* Jacquemont, Voy. dans L'Inde. 4, Zool. 66. Kashmir (Type not known).

COLLECTING CENTRES (No. of Specimens): Tilel valley (1), Hills between Wardwan and Kashmir (1), Deoari (Baltistan) (1); Kaghan Valley (5) and Hazara (2) in West Pakistan.

HABITAT: Dry temperate and sub-tropical dry evergreen forests.

REMARKS: Ellerman and Morrison-Scott (1951) indicated its range to Kashmir only, but the specimens from Kaghan Valley and Hazara (N. W. Frontier Province) extend the range to these areas of West Pakistan.

Marmota caudata aurea Blanford, 1875.

1875. *Arctomys aureus* Blanford, J. Asiat. Soc. Bengal, 44; 106, 123. Kaskaus Pass, mountains West of Yarkand, Chinese Turkestan (Type not known).

1916. *Marmota stirlingi* Thomas, J. Bombay N. H. Soc. 24, 2: 341, Head of Chitral Nullah, Chitral, 11000 ft. North-west Frontier, (Type Adult (?) B. M. No. 15.7.1.10).

COLLECTING CENTRE (No. of Specimen): Chitral (West Pakistan) (1).

HABITAT: Dry temperate forests.

Marmota caudata dichrous Anderson, 1875.

1875. *Arctomys dichrous* Anderson, Ann. Mag. N. H. 16: 283. Hills north of Kabul, Afghanistan (Cotype Adult (?) B. N. No. 76.2.12.4).

COLLECTING CENTRE (No. of Specimens): Skins purchased in Peshawar Market (West Pakistan) (2).

REMARKS: Two skins of this subspecies were purchased in Peshawar and presented to the Museum by Poland & Sons. This specis has only been reported from Afghanistan. Either these specimens were collected in Afghanistan and brought for sale in Peshawar or these were collected from the areas near Peshawar. Its range cannot be extended to N. W. Frontier areas until further collections have been obtained.

Skull measurements (in mm.) of the specimens of *Marmota* species examined.

Brit. Mus. No., Sex and Locality		Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
M. bobak himalayana					
23.9.1.39, ♂, Lingti, Lahul, Ksahmir	...	106.7	45.0	65.4	23.8
23.9.1.41, ♀, Lingti, Lahul, Kashmir	...	104.2	45.1	66.9	24.9
36.4.12.6, ♂, Karpo valley, East Ladak	...	80.3	31.7	52.0	23.0
91.10.7.97, (?), Sikkim	...	100.2	42.0	66.5	23.0
Average	...	97.9	40.9	62.7	23.9

Brit. Mus. No., Sex and Locality		Occipito-nasal length	Nasal length	Zygomatic width	Upper-cheek teeth
M. caudata caudata					
8.7.6.27, ♀, Hills between Wardwan and Kashmir	...	102.1	40.6	63.7	22.3
8.10.3.16, ♀, Hazara, West Pakistan	...	101.2	40.0	61.2	22.9
8.10.3.17, ♀, Hazara, West Pakistan	...	100.1	40.0	60.3	22.2
10.12.2.25, ♀, Kaghan Valley, West Pakistan	...	107.4	44.4	65.2	23.6
Average	...	102.7	41.5	62.6	22.8
M. caudata aurea					
15.7.1.10, (?), Chitral, West Pakistan-*Type*	...	...	...	...	19.8
76.3.9.3, ♀, Yarkand	...	93.6	35.5	58.0	21.9
76.3.9.4, (?), Yarkand	...	91.0	36.5	55.8	21.8
M. caudata dichrous					
76.2.12.4, (?), Hills north of Kabul-*Cotype*	...	89.2	39.3	...	21.8

MYOMORPH SERIES

Super-family DIPODOIDAE.

Family DIPODIDAE

KEY TO THE GENERA

1. Five functional toes on hindfoot; three central metatarsal bones not fused to form a cannon-bone.....*Sicista*. Gray.

2. Five or three hind toes on hindfoot, but only three functional (the outer ones not reaching the ground); three central metatarsal bones fused to form cannon-bone.
.....*Allactaga* Cuvier.

Sub-family Sicistinae

Genus *SICISTA* Gray, 1827.

KEY TO THE SPECIES

1. General fur colour rufous grey, becoming clearer rufous on the sides; dorsal stripes absent.....*leathemi* Thomas.

2. General fur colour yellowish grey without any rufous tinge on back; dorsal stripes dim.....*flavus* True.

Sicista concolor leathemi Thomas, 1893. Chinese Birch Mouse.

1893. *Sminthus leathemi* Thomas, Ann. Mag. N. H. 11: 184. Krishnye Valley, Wardwan, Kashmir (Type Adult (?) B. M. No. 93.4.15.1).

COLLECTING CENTRES (No. of Specimens): Kaghan Valley (West Pakistan) (1); Rupal (2), Astor (1), Malangan, Kagnag mountains (1), in Kashmir.

HABITAT: Dry temperate forests.

Sicista concolor flavus True, 1894.

1894. *Sminthus flavus* True, Proc. U. S. Nat. Mus. 17: 341. Central Kashmir, 11000 ft. (Type ♂ U. S. Nat. Mus. $\frac{20140}{35503}$).

REMARKS: This subspecies has been reported by Ellerman and Morrison-Scott (1951) from Central Kashmir (includes Azad Kashmir) but there is no specimen from Kashmir in the B. M. Collection.

Sub-family Dipodinae

Genus *ALLACTAGA* Cuvier, 1836.

Allactaga elater indica Gray, 1842. Small Five-toed Jerboa.

1842. *Allactaga indica* Gray, Ann. Mag. N. H. 10: 262. Simkoh Hills, Afghanistan (Type Adult (?) B. M. No. 44.9.15.4).

COLLECTING CENTRES (No. of Specimens): Himalaya (1), Surab (Baluchistan) (1), Quetta (1) and Pishin (1) Baluchistan, West Pakistan collected by Zoological Survey of Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

Allactaga hotsoni Thomas, 1920. Hotson's Five-toed Jerboa.

1920. *Allactaga hotsoni* Thomas, J. Bombay N. H. Soc. 26, 4: 936. Kant, 20 miles south-west of Sib, 3950 ft., Persian Baluchistan (Type Adult ♀ B. M. No. 19.11.8.56).

COLLECTING CENTRE (No. of Specimen): Kant (Baluchistan), West Pakistan (1).

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Sicista* sp. and *Allactaga* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
S. concolor leathemi				
93.4.15.1, (?), Wardwan, Kashmir-*Type* ...	19.6	7.3	...	3.2
1.8.4.9, ♂, Astor Valley, Kashmir ...	...	7.3	...	3.2
8.12.12.3, (?), Rupal, Astor, Kashmir ...	...	7.8	...	3.1
12.11.29.6 , ♂, Kaghan Valley, West Pakistan ...	...	7.7	...	3.2
36.2.18.40, ♀, Rupal, Astor, Kashmir ...	19.3	7.7	9.2	3.2
94.10.2.1, ♀, Kagnag mountains, Kashmir ...	19.9	7.7	...	3.2
Average ...	19.6	7.6	9.2	3.2
A. elater indica]				
44.9.15.4, (?), Simkoh Hills, Afghanistan-*Type* ...	23.4	8.7	...	5.4
19.7.7.2355, (?) Tehran Road (Doria) Persia ...	25.8	9.0	18.5	5.5
19.11.8.55, ♀, Surab (Baluchistan), West Pakistan ...	25.2	8.9	20.0	5.3
47.12.5.2, (?), Afghanistan ...	24.1	8.5	17.3	5.3
56.2.29.7, (?), Afghanistan ...	25.6	9.3	21.2	5.3
Z.S.P. (?), Pishin (Baluchistan), West Pakistan	...	8.8	...	5.4
Average ...	24.8	8.9	19.3	5.4
A. hotsoni				
19.11.8.56, ♀, Kant (Baluchistan) West Pakistan -*Type* ...	28.7	11.6	21.4	5.4

Superfamily MUROIDAE

KEY TO THE FAMILIES

1. Upper and lower cheekteeth with transverse ridges extending across the crown; premolars usually, not always, present,
   .....MUSCARDINIDAE.
2. Upper and lower cheekteeth without transverse ridges; premolars invariably absent.
   (*i*) Infra-orbital foramen much reduced, its lower border nearly straight; cheekteeth flat crowned.
   .....RHIZOMYIDAE.

(*ii*) Infra-orbital foramen not much reduced, its lower border usually V-shaped; cheekteeth complexly prismatic in pattern. .....MURIDAE.

Family MUSCARDINIDAE

Sub-family Muscardinidae

Genus *DRYOMYS* Thomas, 1906.

Characters of *Dryomys nitedula:*

Tail fully haired and bushy; ears large and cheekteeth cuspidate 4/4 premolars retained.

Dryomys nitedula pictus Blanford, 1875. Forest Dormouse.

1875. *Myoxus pictus* Blanford, Ann. Mag. N. H. 17: 311. Kohrud, south of Caspian Sea, Persia (Type Adult ♀ B. M. No. 74.11.21.44); skin in alcohol, skull broken).

COLLECTING CENTRE (No. of Specimen): Khurram valley (N. W. Frontier Province), West Pakistan (2)-only skins in the collection.

HABITAT: Dry temperate forests.

Family RHIZOMYIDAE

KEY TO THE GENERA

1. M^1 normally smaller than M^2 and often worn below its level; fur thick and the colour typically dark, almost chocolate brown; soles of feet granulated. .....*Rhizomys pruinosus* Blyth.

2. M^1 is larger than M^2 and not worn below its level; fur tending to be less short or harsh and colour to be slightly darker; sole pads not granulated. .....*Cannomys badius* Hodgson.

Genus *RHIZOMYS* Gray, 1831.

Rhizomys pruinosus pruinosus Blyth, 1851. Hoary Bamboo Rat.

1851. *Rhizomys pruinosus* Blyth, J. Asiat. Soc. Bengal, 20: 519. Cherrapunji, Khasi Hills, Assam (Cotypes-Ind. Mus. Calcutta Nos. 1 m and n).

REMARKS: Specimens of this species from different parts of Assam and Manipur in the B. M. Collection indicate the likelihood of its occurrence in West Pakistan.

Genus *CANNOMYS* Thomas, 1915.

Cannomys badius badius Hodgson, 1842. Bay Bamboo Rat.

1842. *Rhizomys badius* Hodgson, Calcutta J. N. H. 2: 60, 410 (for April, 1841). Nepal (Type Adult ♂ N. M. No. 43.1.12.61).

REMARKS: Specimens of this species from different areas of Bengal, Manipur and Assam in the B. M. Collection establish its occurrence in East Pakistan.

Skull measurements (in mm.) of the specimens of *Dryomys* sp., *Rhizomys* spp. and *Cannomys* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
D. nitedula pictus				
74.11.21.44, ♀, Kohrud, Persia-*Type* ...	...	9.5	...	3.8
R. purinosus pruinosus.				
20.11.1.43, ♀, Cherrapunji, Assam ...	53.2	22.3	44.5	12.5
47.262, ♂, Naga Hills, Assam ...	56.0	24.3	49.5	12.5
47.264, ♀, Naga Hills, Assam ...	54.6	24.9	47.5	12.5
47.265, ♀, Naga Hills, Assam ...	53.8	23.1	46.9	12.4
Average ...	54.4	23.6	47.1	12.5
C. badius badius				
43.1.12.61, ♂, Nepal-*Type* ...	43.0	16.5	...	10.9
16.7.29.80, ♂, Hassimara, Bhutan Duars ...	41.3	16.0	36.4	10.4
20.6.7.58, ♀, Mikir Hills, Assam ...	43.1	18.1	36.8	10.8
27.7.8.58, ♂, Rajapara, S. Kamrup ...	38.4	15.2	34.1	9.3
47.248, ♂, Bishampur, Manipur ...	40.5	17.2	36.9	9.9
47.254, ♂, Naga Hills, Assam ...	39.9	15.6	35.0	9.6
Average ...	41.0	16.4	35.8	10.2

Family MURIDAE

KEY TO THE SUB-FAMILIES

1. Cheek-teeth complexly prismatic in pattern and frequently ever-growing;
   (*i*) Squamosal crest well developed; bullae enlarged; tail relatively short and hairy .....MICROTINAE.
2. Cheek-teeth not complexly prismatic in pattern (mostly rooted);
   (*i*) Upper cheek-teeth more or less flat-crowned and simple prismatic in type; upper incisors usually grooved; bullae inflated; tail long and hairy.....GERBILLINAE.

(*ii*) Upper cheek-teeth laminate or cuspidate, the laminae separated by fairly wide folds on each side; two well marked rows of cusps present; tail well haired.
.....CRICETINAE.

(*iii*) Upper cheek-teeth laminate or cuspidate; when laminate the laminae pressed together and not separate by folds; when cuspidate, the cusps found in three well marked rows; tail long and naked.....MURINAE.

Sub-family Murinae

KEY TO THE GENERA

A. Hallux clawless and apparently fully opposable.
(*i*) first and second upper molars with distinct postero-internal cusp; fifth finger without a claw.
.....*Vandeleuria* Gray.

B. Hallux clawed and not fully opposable.

1. Upper incisors longitudinally grooved.
(*i*) M^3 large with no outer row of cusps; no postero-internal cusp in M^1 and M^2.....*Golunda* Gray.

2. Upper incisors normally not grooved.
(*a*) Palatal foramina not reduced, and most often exceeding 18% of occipitonasal length (more than 7 mm. in length).
(*i*) Tail usually exceeds three quarters of the head and body length.....*Bandicota* Gray.

(*b*) Palatal foramina strongly shortened, averaging 14% or less of occipitonasal length (less than 7 mm. in length).
(*i*) Tail usually less than three quarters of the head and body length.....*Nesokia* Gray.

(*c*) Palatal foramina lengthened, usually about 23% of occipitonasal length.
(*i*) Mesopterygoid fossae roofed in by bone anteriorly; M^1 and M^2 without posterio-internal cusp; fur densely spiny. .....*Acomys* Geoffroy.
(*ii*) Mesopterygoid fossae not roofed in by bone anteriorly; M^1 and M^2 with well developed postero-internal cusp; fur not spiny. .....*Apodemus* Kaup.
(*iii*) Palate long exceeding half the occipitonasal length; planter pads less than six; fifth hind toe small.
.....*Millardia* Thomas.

(*d*) Palatal foramina less than 23% of occipitonasal length.

(*i*) Palate short less than half the occipitonasal length; planter pads six and the fifth hind toe long.
.....*Rattus* Fischer.

(*ii*) M^1 enlarged with its anterior root much projected forwards; M^3 reduced.....*Mus* Linnaeus.

Genus *VANDELEURIA* Gray, 1842.

Vandeleuria oleracea dumeticola Hodgson, 1845. Indian Long-tailed Tree Mouse.

1845. *Mus dumeticola* Hodgson, Ann. Mag. N. H. 15: 268. Nepal (Type Adult (?) B. M. No. 43.1.12.74).

REMARKS: Specimens from different parts of Bengal, Assam and Manipur in the B. M. Collection indicate the possibility of its occurrence in East Pakistan.

Genus *APODEMUS* Kaup, 1829.

REMARKS: Details about the specimens of *Apodemus* species in the B. M. Collection, their identification and distribution, have been dealt with separately in a paper-"Notes on a collection of *Apodemus* Kaup from the Indo-Pakistan subcontinent."

Genus *MILLARDIA* Thomas, 1911.

KEY TO THE SPECIES

1. Larger forms with eight mammae, pectoral pairs present; general fur colour pale dirty grey.....*meltada pallidior* Ryley.
2. Smaller forms with six mammae; general fur colour light grey. .....*gleadowi* Murray.

Millardia meltada pallidior Ryler, 1914. Soft-furred Field Rat.

1914. *Millardia meltada pallidior* Ryler, J. Bombay N. H. Soc. 22: 659. Lunwa, Palanpur, Gujerat, 150 ft. India (Type Adult ♂ B. M. No. 13.8.23.2).

1917. *Millardia meltada dunni* Thomas, J. Bombay N. H. Soc. 25: 202. Handiserah, Ambala, Punjab (Type Adult ♂ B. M. No. 8.3.3.5).

COLLECTING CENTRES (No. of Specimen): Umarkot (1), Sukkur (1), Pathankote (Salt Range) (1)-all in West Pakistan.

HABITAT: Tropical thorn forests.

Millardia gleadowi Murray, 1885. Sand-coloured Rat.

1885. *Mus gleadowi* Murray, P. Z. S. 809. Clifton Plain, Karachi, Western Sind, India (Cotypes B. M. Nos. 86.1.30.1-3).

COLLECTING CENTRES (No. of Specimens): Thar and Parkar (Sind) (3), Kirgi (S. Waziristan) (3), West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Vandeleuria* species and *Millardia* species examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek-teeth
V. oleracea meticola				
16.3.25.63, ♂, Darjeeling, Bengal ...	21.1	6.4	11.3	3.4
16.7.29.62, ♂, Bhutan Duars ...	21.1	6.7	11.4	3.4
21.1.6.63, ♀, Jantia Hills, Assam ...	21.3	6.9	11.4	3.4
Average ...	21.3	6.7	11.4	3.4
M. meltada pallidior				
13.8.23.2, ♂, Palanpur, Gujerat-*Type* ...	31.0	12.4	15.0	5.4
8.3.3.5, ♂, Ambala, Punjab-*Type* ...	29.8	12.3	14.7	5.1
13.9.18.56, ♀, Gujerat ...	32.1	12.1	16.0	5.8
23.4.6.2, ♂, Dhamtal, Kangra ...	35.6	14.4	16.5	5.9
23.11.3.85, ♂, Pathankote, West Pakistan ...	31.6	12.4	16.0	5.8
83.4.23.4, (?), Sukkur, Sind, West Pakistan ...	32.2	12.4	16.2	5.8
Average ...	32.0	12.7	15.7	5.6
M. gleadowi				
86.1.30.1, (?), Karachi, West Pakistan-*Type* ...	24.4	11.2	...	4.6
11.3.13.10, ♀, Thar Parkar, Sind, West Pakistan	26.8	10.6	13.9	4.5
13.8.8.80, ♂, Dharangadhra, Kathiawar, India	25.3	10.1	12.3	4.7
13.8.8.81, ♂, Muli, Kathiawar, India ...	23.8	9.4	11.5	4.7
14.11.28.1, ♀, Sind, West Pakistan ...	26.7	10.5	...	4.5
14.11.28.2, ♀, Sind West Pakistan ...	26.2	9.8	13.3	4.7
20.6.1.3, ♀, Kirgi (N. W. F. P.) West Pakistan...	24.1	9.2	12.1	4.7
Average ...	25.2	10.0	12.5	4.6

Genus *RATTUS* Fischer, 1803

KEY TO THE SPECIES: (MODIFIED FROM ELLERMAN, 1941)

1. Tail normally of two colours, mostly dark above and pale below. .....*rattoides* Hodgson.
   underparts normally white and occipitonasal length more than 36 mm.....*rattoides turkestanicus* Satunin.

II. Tail usually of one colour, wholly dark.

1. Nasal length about 40% or more of the occipitonasal length .....*nitidus* Hodgson
   Fur very soft, tail longer than head and body. .....*nitidus nitidus* Hodgson.

2. Nasal shorter, less than 40% of the occipitonasal length.

(A) Built slender, tail longer than head and body; cranial lateral ridges not parallel, converging posteriorly..... *rattus* Linnaeus.

(*a*) Tail usually more than 130% of head and body length; occipitonasal length about 41 mm. or more.....*rattus arboreus* Horsfield.

(*b*) Tail usually more than 120% of head and body length;
(*i*) ventrum black or very dark brown. .....*rattus rattus* Linnaeus.
(*ii*) ventrum grey.....*rattus alexandrinus* Geoffroy.
(*iii*) ventrum cream (Town Rat) .....*rattus frugivorus* Rafinesque.
(*iv*) ventrum ochraceous (Open Country Rat) .....*rattus ruffescens* Gray.

(B) Size large, build heavy, tail either the same length or shorter than head and body; cranial lateral ridges parallel and heavy. .....*norvegicus* Berkenhout.

Subgenus *RATTUS* Fischer, 1803.

Rattus rattus rattus Linnaeus, 1758. House Rat.

1758. *Mus rattus* Linnaeus, Syst. Nat. 10th ed. 1: 61. Sweden (Type not known).

COLLECTING CENTRE (No. of Specimens): Karachi, West Pakistan (2) collected by Zoological Survey of Pakistan.

Rattus rattus alexandrinus Geoffroy, 1803.

1803. *Mus alexandrinus* Geoffroy, Cat. Mamm. H. N. Paris, 192. Alexandria, Egypt (Type not known).

COLLECTING CENTRES (No. of Specimens): Karachi (1), Gilgit (Azad Kashmir) (2); Campbellpore (1), Pasni (Baluchistan) (3), and also Karachi (41) collected by Zoological Survey of Pakistan.

Rattus rattus frugivorous Rafinesque, 1814.

1814. *Musculus frugivorus* Rafinesque, Precis des Decouv. et. Travaux Somiol. 13. Sicily (Type not known).

COLLECTING CENTRE (No. of Specimens): Karachi (21) collected by Zoological Survey of Pakistan.

Rattus rattus rufescens Gray, 1837.

1837. *Mus rufescens* Gray, Ann. Mag. N. H. 1: 585. Dharwar, India. The Common Indian commensal form; very like *alexandrinus* (Type Adult (?) B. M.No. 44.9.15.2).

COLLECTING CENTRES (No. of Specimens): Rawalpindi (7), Ara (1), Chakdulla (1), Gambat (1), Sukkur (1), Jacobabad (8), Kashmor (2), Umarkot (1), Panoaqil (5), Hubb valley (Sind) (1), Pasni (Baluchistan) (3) and also Karachi (1) collected by Zoological Survey of Pakistan.

Rattus rattus arboreus Horsfield, 1851.

1851. *Mus arboreus* (Buchanan Hamilton) Horsfield, Cat. E. Ind. Mus. 141. Bengal (Type-not known).

REMARKS: Its range includes Bengal, but there is no specimen from East Pakistan.

Rattus nitidus nitidus Hodgson, 1845. Himalayan Rat.

1845. *Mus nitidus* Hodgson, Ann. Mag. N. H. 15: 267. Nepal (Type Adult (?) B. M. No. 79.11.21.415).

COLLECTING CENTRES (No. of Specimens): Murree (West Pakistan) (2), Namla (2) and Jhelum Valley (Poonch) (1)-all in Kashmir (includes Azad Kashmir).

HABITAT: Sub-tropical dry evergreen forests.

REMARKS: Ellerman and Mossison-Scott (1951) give the range of this subspecies from Kumaon (U.P., India) eastwards to Assam and Northern Burma, but the specimens from Murree in West Pakistan and Jhelum Valley, Kahira and Poonch valley in Kashmir (includes Azad Kashmir) in the B. M. Collection enable its range to be extended to the West of Kumaon in Punjab and Kashmir.

Rattus rattoides turkestanicus Satunin, 1903. Turkestan Rat.

1903. *Mus turkestanicus* Satunin, Ann. Mus. St. Petersb. 7: 588. Assam-bob, Ferghana, Russian Turkestan (April, 1903).

1903. *Mus vicerax* Bonhote, Ann. Mag. N. H. 11: 473. Simla, Northern India, (May, 1903)-(Type Adult (?) B. M. No. 85.8.1.313).

COLLECTING CENTRES (No. of Specimens): Beriji (Gilgit) (2), Kotli (1), Poonch Road (2), Sardallu (2), all in Kashmir, Chashma Shahi (N. W. Punjab) (1), Chakdulla (2), Dunga gali (2), Sambli (2), Murree (7), Charehan (2), Bhurban (3), Patriata (3), Lehtrar (4), Ara (1) Kallar Kahar (1), Sakesar (1), Gandhala (5) all in West Pakistan.

HABITAT: Subtropical dry evergreen forests.

Rattus norvegicus norvegicus Berkenhout, 1769. Brown Rat.

1769. *Mus norvegicus* Berkenhout, Outlines N. H. Great Britain and Ireland 1: 5 (N. V.) Great Britain (Type-not known).

COLLECTING CENTRES (No. of Specimens): Karachi (1) and Murree (1)-(spirit collection) and also Karachi (6) collected by Zoological Survey of Pakistan.

Principal measurements (in mm.) of the specimen of *Rattus* spp. examined:

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
R. rattus rattus						
Z.S.P. 107, ♀, Nanakwara, Karachi, West Pakistan ...	130	109	...	...	17.6	6.1
Z.S.P. 153/3, ♂, Joria Bazar, Karachi, West Pakistan ...	114	105	32.2	10.5	...	...
R. rattus alexandrinus						
19.11.7.73, ♂, Pasni, Baluchistan West Pakistan ...	...	...	38.4	13.6	18.2	6.6

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
19.11.7.74, ♀, Pasni, Baluchistan, West Pakistan ...	...	...	40.7	15.1	19.2	6.9
19.11.7.75, ♀, Pasni, Baluchistan, West Pakistan ...	...	...	43.0	15.7	20.3	6.9
25.6.10.28, ♂, Campbellpore, N. W. Punjab ...	...	...	41.9	15.4	21.0	7.1
Z.S.P. 22, ♂, Karachi West Pakistan ...	185	210	44.1	17.0	...	7.5
Z.S.P. 49, ♂, Karachi, West Pakistan ...	165	...	40.7	14.5	19.2	7.2
Z.S.P. 50/1, ♀, Karachi, West Pakistan	135	160	...	...	16.4	...
Z.S.P. 52, ♀, Karachi, West Pakistan...	125	135	39.8	14.2	19.0	6.4
Z.S.P. 59/1, ♂, Karachi, West Pakistan	172	225	41.4	14.9	19.9	6.5
Z.S.P. 63.1/ ♂, Karachi, West Pakistan	142	169	...	...	...	...
Z.S.P. 103, ♀, Civil Lines, Karachi, West Pakistan ...	156	126	34.4	13.0	...	7.3
Z.S.P. 109, ♀, Civil Lines, Karachi, West Pakistan ...	135	106	34.8	11.4	16.8	6.3
Z.S.P. 110, ♀, Soldier Bazar, Karachi, West Pakistan ...	155	187	...	13.0	...	6.8
Z.S.P. 110/1, ♀, Soldier Bazar, Karachi West Pakistan ...	135	130	...	...	...	...
Z.S.P. 114, ♀, Soldier Bazar, Karachi, West Pakistan ...	162	201	35.6	12.5	...	...
Z.S.P. 114/1, ♀, Soldier Bazar, Karachi, West Pakistan ...	173	195	...	13.0	18.7	6.4
Z.S.P. 115, ♂, Aram Bagh, Karachi, West Pakistan ...	166	125	...	...	...	7.1
Z.S.P. 115/1, ♀, Aram Bagh, Karachi, West Pakistan ...	167	125	39.3	14.6	19.2	6.9
Z.S.P. 148, ♀, Golimar, Karachi, West Pakistan ...	132	181	35.4	12.2	16.9	6.1
Z.S.P. 148/1, ♂, Golimar, Karachi, West Pakistan ...	125	154	36.4	13.2	17.3	6.2
Z.S.P. 148/2, ♀, Golimar Karachi, West Pakistan ...	137	190	33.8	11.9	16.7	6.4

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
Z.S.P. 148/3, ♂, Golimar, Karachi, West Pakistan ...	133	169	35.1	11.4	16.0	6.1
Z.S.P. 149/1, ♂, Civil Lines, Karachi, West Pakistan ...	115	141	...	...	...	...
Z.S.P. 150, ♂, Lyari Area, Karachi, West Pakistan ...	124	169	...	11.4	...	...
Z.S.P. 150/1, ♂, Lyari Area, Karachi, West Pakistan ...	139	204	...	12.6	...	...
Z.S.P. 150/2, ♀, Lyari Area, Karachi, West Pakistan ...	162	224	39.6	14.2	19.1	6.5
Z.S.P. 151, ♂, Nazimabad, Karachi, West Pakistan ...	151	207	39.4	14.3	18.8	6.2
Z.S.P. 153, ♀, Joria Bazar, Karachi, West Pakistan ...	131	125	35.6	12.3	17.3	6.9
Z.S.P. 153/2, ♀, Joria Bazar, Karachi West Pakistan ...	122	160	33.2	11.5	15.9	6.1
Z.S.P. 154, ♂, Abyssinia Lines, Karachi, West Pakistan ...	122	150	33.4	10.9	16.2	...
Z.S.P. 154/1, ♀, Abyssinia Lines, Karachi, West Pakistan ...	178	209	39.3	14.3	18.8	6.6
Z.S.P. 154/2, ♀, Abyssinia Lines, Karachi, West Pakistan ...	116	145	30.8	10.2	15.7	6.3
Z.S.P. 154/3, ♀, Abyssinia Lines, Karachi, West Pakistan ...	120	168	31.5	10.3	15.1	6.0
Z.S.P. 154/4, ♀, Abyssinia Lines, Karachi, Wes tPakistan ...	152	201	36.5	12.3	17.7	6.5
Z.S.P. 156, ♀, Railway Colony, Karachi, West Pakistan ...	142	137	37.0	13.8	18.0	7.3
Z.S.P. 156/1, ♀, Railway Colony, Karachi, West Pakistan ...	172	161	40.2	14.7	19.5	7.3
Z.S.P. 156/2, ♀, Railway Colony, Karachi, West Pakistan ...	154	140	37..9	13.9	18.5	7.3
Z.S.P. 156/3, ♀, Railway Colony Karachi, West Pakistan ...	124	119	33.8	12.6	16.8	7.3

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
Z.S.P. 157, ♀, Pak. Colony, Karachi, West Pakistan ...	146	154	40.1	14.1	19.0	7.1
Z.S.P. 157/1, ♀, Pak. Colony, Karachi, West Pakistan ...	144	131	...	12.4	...	6.8
Z.S.P. 157/2, ♂, Pak. Colony, Karachi, West Pakistan ...	172	184	42.0	16.3	19.4	7.2
Z.S.P. 158/1, ♀, Mosa Lines, Karachi, West Pakistan ...	156	131	37.6	13.5	18.2	7.4
Z.S.P. 178, ♀, Lasbella House, Karachi, West Pakistan ...	145	183	...	...	...	...
Average ...	146	164	37.9	13.3	18.0	6.8
R. rattus frugivorus						
Z.S.P. 1, ♀, Ghizri area, Karachi, West Pakistan ...	...	...	38.7	13.8	19.0	6.3
Z.S.P. 61/1, ♂, Karachi, West Pakistan	162	214	39.0	12.9	18.9	6.7
Z.S.P. 102/1, ♂, Soldier Bazar, Karachi, West Pakistan ...	142	175	32.4	13.5	...	7.5
Z.S.P. 103/1, ♀, Civil Lines, Karachi, West Pakistan ...	122	207	38.6	13.5	19.4	6.7
Z.S.P. 105/1, ♀, Civil Lines, Karachi, West Pakistan ...	135	180	36.2	12.3	17.3	6.6
Z.S.P. 108, ♂, Civil Lines, Karachi, West Pakistan ...	142	199	34.1	11.8	16.6	6.5
Z.S.P. 108/1, ♀, Civil Lines, Karachi, West Pakistan ...	155	185	37.9	13.9	18.5	6.6
Z.S.P. 111, ♂, Soldier Bazar, Karachi, West Pakistan ...	160	207	...	13.7	18.9	6.5
Z.S.P. 111/1, ♀, Soldier Bazar, Karachi, West Pakistan ...	181	222	...	13.2	...	6.5
Z.S.P. 112, ♂, Soldier Bazar, Karachi, West Pakistan ...	165	201	37.5	13.2	18.6	6.5
Z.S.P. 112/1, ♀, Soldier Bazar, Karachi, West Pakistan ...	161	171	35.8	12.7	18.3	5.8

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
Z.S.P. 113, ♂, Soldier Bazar, Karachi, West Pakistan ...	164	218	37.8	13.6	18.1	6.6
Z.S.P. 113/1, ♀, Soldier Bazar, Karachi, West Pakistan ...	170	223	37.9	13.7	18.1	6.6
Z.S.P. 149/2, ♀, Civil Lines, Karachi, West Pakistan ...	121	150	32.1	11.5	15.7	6.1
Z.S.P. 151/1, ♀, Karachi, West Pakistan	...	...	32.8	13.0	...	...
Z.S.P. 151/3, ♂, Nazimabad, Karachi, West Pakistan ...	127	161	...	...	...	...
Z.S.P. 155, ♂, Shershah Colony, Karachi, West Pakistan ...	128	165	34.8	12.1	16.3	6.0
Average ...	149	192	36.1	13.0	18.0	6.6
R. rattus rufescens						
15.11.1.110, ♂, Jacobabad, Sind, West Pakistan ...	...	...	38.1	13.4	20.1	6.7
15.11.1.112, ♀, Kashmor, Sind, West Pakistan ...	...	...	39.5	13.4	19.4	7.0
15.11.1.114, ♀, Jacobabad, Sind, West Pakistan ...	...	...	37.1	13.1	17.2	6.6
15.11.1.115, ♂, Gambat, Sind, West Pakistan ...	...	...	40.2	14.0	19.2	6.8
23.11.3.76, ♀, Ara, Salt Range, West Pakistan ...	...	...	39.3	14.0	19.5	6.9
Z.S.P. 102, ♂, Soldier Bazar, Karachi, West Pakistan ...	170	192	38.9	13.5	18.6	6.4
Average ...	...	...	38.9	13.6	19.0	6.7
R. rattoides turkestanicus						
85.8.1.313, (?), Simla Northern India-*Type* ...	...	...	40.1	15.2	...	6.9
5.11.19.7, ♂, Murree, West Pakistan ...	...	...	38.9	14.5	18.5	6.9
8.10.3.5, ♂, Donga gali, West Pakistan	...	...	32.8	10.2	...	6.5
8.10.3.6, ♀, Donga gali, West Pakistan	...	...	...	16.8	...	7.0
23.11.4.17, ♀, Lehtrar, West Pakistan...	...	...	40.2	14.9	18.8	6.8
23.11.4.24, ♂, Murree, West Pakistan...	...	...	38.0	14.2	18.5	6.7

Brit. Mus. No., Sex and Locality	Length H & B	Tail	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
23.11.82, ♂, Ara (Salt Range), West Pakistan ...	...	...	42.8	16.6	19.6	7.0
25.6.10.31, ♂, Chakdulla, West Pakistan	...	...	40.9	15.6	19.5	6.7
Average ...	...	...	39.1	14.8	18.9	6.8
R. nitidus nitidus						
5.11.19.5, ♂, Murree, Punjab, West Pakistan ...	...	...	39.7	14.0	20.5	6.5
5.11.19.6, ♀, Murree, Punjab, West Pakistan ...	...	...	39.8	14.0	19.6	6.8
8.7.6.67, ♀, Jhelum Valley, Kashmir	...	...	33.8	12.0	16.6	6.8
8.7.6.70, ♀, Poonch Valley, Azad Kashmir ...		...	44.2	15.4	20.2	7.2
8.7.6.73, ♀, Jhelum Valley, Kashmir ...	...	...	42.6	15.1	21.2	7.2
8.7.6.74, ♀, Jhelum Valley, Kashmir ...	...	...	40.0	15.3	19.7	7.0
Average ...	...	...	40.0	14.3	19.6	6.9
R. norvegicus norvegicus						
Z.S.P. 59, ♀, Karachi, West Pakistan	222	201	47.4	18.6	23.3	7.3
Z.S.P. 68, ♀, Karachi, West Pakistan ...	235	190	46.9	17.6	22.7	7.2
Z.S.P. 107/1, ♀, Nanakwara, Karachi, West Pakistan ...	205	157	40.2	15.2	...	6.6
Z.S.P. 109, ♂, Saddar, Karachi, West Pakistan ...	203	188	42.7	15.7	20.8	6.8
Z.S.P. 109/1, ♀, Saddar, Karachi, West Pakistan ...	192	177	...	...	21.3	6.6
Z.S.P. 152, ♂, Soldier Bazar, Karachi, West Pakistan ...	211	184	48.1	19.2	...	7.2
Average ...	211.3	182.7	45.0	17.3	22.0	6.9

Genus *MUS* Linnaeus, 1758.

KEY TO THE SPECIES

Palatal foramina more than one-fifth of occipitonasal length.

1. Muzzle short, the diastema generally less than one-quarter of occipitonasal length.

Form large with occipitonasal length more than 23 mm. and upper cheek-teeth less than 3.8 mm.

.....*musculus* Linnaeus.

(*a*) ventral fur colour white or light grey.

(*i*) Dorsal fur colour sandy grey, sometimes with rufous tinge.

.....*musculus bactrianus* Blyth.

(*ii*) Dorsal fur colour generally darker than *bactrianus*, sometimes ventral fur is also slightly darker.

.....*musculus homourus* Hodgson.

(*b*) Ventral fur colour dark brown or of dull colour

(*i*) Dorsal fur rufous brown to blackish brown and ventral fur of lighter colour.

.....*musculus castaneus* Waterhouse.

(*ii*) General fur colour darker than *castaneus*.

.....*musculus urbaneus* Hodgson.

(*iii*) Dorsal fur light brown with rufous tinge and the ventral fur very lighter.

.....*musculus tytleri* Blyth.

2. Muzzle not short, the diastema generally more than one-quarter of the occipitonasal length.

(*a*) Smaller forms with occipitonasal length less than 20 mm.; tail more than 90% of head and body length.

.....*booduga booduga* Gray.

(*b*) Larger forms with occipitonasal length less than 25 mm.: tail less than 90% of head and body length; dorsal fur grey partly with spines, ventral fur white.

.....*platythrix sadhu* Wroughton.

Sub-genus *Mus* Linnaeus, 1758.

Mus musculus bactrianus Blyth, 1846. House Mouse.

1846. *Mus bactrianus* Blyth, J. Asiat. Soc. Bengal, 15: 140. Kandahar, Afghanistan (Lectotype Adult ♀ B. M. No. 56.2.29.4).

COLLECTING CENTRES (No. of Specimens): Lehtrar (6), Patriata (1), Banni (1), all in Murree district, Kallar Kahar (7), Dail (1), Sakesar (1), Jhelum (2), Ara (1), Rohtas (1)-all in Salt Range; Chaklala (Rawalpindi) (1), Chakdula (2), Jhalar (Campbellpur) (1), Sialkot (1)-all in Punjab, Jacobabad (8), Kashmor (1), Sukkur (1),

Gambat (1), Naundero (4), Umarkot (3) and Karachi (2)-all in Sind; Sibi (2), Mastung (9), Kalat (1), Surab (4), Chib (3), Khojdar (2), Panjgur, (19) Ispikan (Mand) (1), Turbat (2), Quetta (3) and Bambis (1)-all in Baluchistan; and also Karachi (1) and Peshawar (2) Collected by Zoological Survey of Pakistan.

Mus musculus homourus Hodgson, 1845.

1845. *Mus homourus* Hodgson, Ann. Mag. N. H. 15: 268. Nepal (Type Adult (?) B. M. No. 79.11.21.406).

REMARKS: Specimens of this subspecies from various parts of Kashmir and Punjab in the B. M. Collection indicate its occurrence in Azad Kashmir and the north-eastern region of West Pakistan.

Mus musculus castaneus Waterhouse, 1843.

1843. *Mus castaneus* Waterhouse, Ann. Mag. N. H. 12: 134. Philippine Islands. (Type not known).

REMARKS: There is no specimen from East Pakistan.

Mus musculus urbanus Hodgson, 1845.

1845. *Mus urbanus* Hodgson, Ann. Mag. N. H. 15: 269. Khatmandu, Nepal (Lectotype (?) B. M. No. 45.1.8.398 in alcohol).

REMARKS: There is no specimen from East Pakistan although that region falls within its range.

Mus musculus tytleri Blyth, 1859.

1859. *Mus tytleri* Blyth, J. Asiat. Soc. Bengal, 28: 296. Dehra Dun, Himalayan Terai, United Provinces, India (Type not known).

REMARKS: West Pakistan, east of the Indus river, is included in its range, but there is no specimen in the B. M. Collection from West Pakistan.

Mus booduga booduga Gray, 1837. Little Indian Field Mouse.

1837. *Leggada booduga* Gray, Charlesworths Mag. N. H. 1: 586. Southern Mahratta Country, India (Cotypes B. M. Nos. 37 a, b and d).

1912. *Leggada dunni* Wroughton, J. Bombay N. H. Soc. 21: 339. Ambala, 900 ft., Punjab (Type old ♂ B. M. No. 9.4.6.36).

COLLECTING CENTRES (No. of Specimens): Rawalpindi (2), Punjab (3).

Mus platythrix sadhu Wroughton, 1911. Indian Brown Spiny Mouse.

1911. *Leggada platythrix sadhu* Wroughton, J. Bombay N. H. Soc. 20, 1: 100. Virawah Sind, India (Type Adult ♂ B. M. No. 11.3.13.8).

COLLECTING CENTRE (No. of Specimen): Lahore district (Punjab) (1).

Skull measurements (in mm.) of the specimens of *Mus* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
M. musculus bactrianus				
56.2.29.4, ♀, Kandahar, Afghanistan-*Lectotype*	21.3	8.3	11.4	3.3
8.10.3.8, ♂, Kaghan Valley, West Pakistan ...	20.1	7.5	...	3.7
15.11.1.106, ♀, Jacobabad, Sind, West Pakistan	20.2	7.5	...	3.6
15.11.1.109, ♂, Naundero, Sind, West Pakistan	...	6.8	...	3.5
19.11.8.20, ♂, Mastung, Baluchistan, West Pakistan ...	22.7	8.6	12.1	3.8
19.11.7.52, ♂, Panjgur, Baluchistan, West Pakistan ...	20.5	7.8	...	3.6
Z.S.P. 2, (?), Abazai Rest House, Peshawar, West Pakistan ...	20.6	7.0	...	3.6
Z.S.P. 4, (?), Malir Cantt., Karachi, West Pakistan ...	18.6	6.8	10.5	3.3
Average ...	20.6	7.5	11.3	3.6
M. musculus homourus				
79.11.21.406, (?), Nepal-*Type* ...	17.5	5.9	...	3.5
M. booduga booduga				
9.4.6.36, ♂, Ambala, Punjab-*Type* ...	17.5	6.0	9.1	3.2
9.4.6.37, ♂, Punjab ...	16.8	5.7	8.5	3.2
9.4.6.39, ♂, Punjab ...	16.7	5.8	8.6	3.2
9.4.6.40, ♂, Punjab ...	16.8	5.9	8.6	3.2
13.8.8.101, ♂, Rajkot, Kathiawar ...	17.8	6.8	9.4	3.2
13.8.8.104, ♂, Bajana, Kathiawar ...	17.6	6.7	...	3.2
Average ...	17.2	6.2	8.8	3.2

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
M. platythrix sadhu				
11.3.13.8, ♂, Virawah, Sind, West Pakistan ... *Type*	24.2	9.4	11.7	4.2
12.9.17.5, ♂, Lahore district, West Pakistan ...	22.4	8.8	11.3	4.3
12.10.4.60, ♂, Dhonsa, Cutch, India ...	24.8	10.8	12.5	4.5
12.10.4.63, ♀, Bhuj, Cutch, India ...	22.1	8.3	10.7	4.2
13.9.18.70, ♂, Rajputana, India ...	23.9	9.8	12.1	4.5
13.9.18.71, ♂, Mt. Abu, Rajputana, India ...	23.8	9.7	12.0	4.5
Average ...	23.5	9.5	11.7	4.3

Genus *GOLUNDA* Gray, 1837.

KEY TO THE SUBSPECIES

1. Tail less than 90% of head and body; fur on back generally less grey. .....*myothrix* Hodgson.
2. Tail more than 90% of head and body; fur on back usually greyer in colour.....*watsoni* Blanford.

Golunda ellioti myothrix Hodgson, 1845. Indian Bush Rat.

1845. *Mus myothrix* Hodgson, Ann. Mag. N. H. 15: 267. Kahulia Powa, Nepal (Type (?) B. M. No. 45.1.8.375; skull-none).

COLLECTING CENTRES (No. of Specimens): Sakesar (1), Dhalwal (1)-Salt Range, West Pakistan.

HABITAT: Tropical thorn forests.

Golunda ellioti watsoni Blanford, 1876.

1876. *Pelomys watsoni* Blanford, Proc. Asiat. Soc. Bengal, 181. Kirther Range, Sind (Type Adult (?) B. M. No. 91.11.1.14).

1923. *Golunda ellioti limitaris* Thomas, J. Bombay N. H. Soc. 29: 373. Eleven miles West of Kohat, N. W. Frontier, India (Type Adult ♀ B. M. No. 6.10.11.3).

COLLECTING CENTRES (No. of Specimens): Jacobabad (1), Sukkur (1), Gambat (1), Naundero (1) and Hubb Valley (West of Karachi (4)-West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Golunda* sp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
G. ellioti myothrix				
23.4.6.9, ♂, Kangra, Punjab ...	30.6	10.5	15.1	6.3
23.4.6.10, ♂, Kangra, Punjab ...	30.1	10.3	15.2	6.4
23.11.3.100, ♀, Dhalwal, Salt Range, Punjab ...	32.3	11.2	...	6.4
76.10.2.1, (?), Dugshai, Punjab ...	...	10.5	15.9	6.4
Average ...	31.0	10.6	15.4	6.4
G. ellioti watsoni				
91.11.1.14, (?), Kirthar Range, Sind, West Pakistan-*Type* ...	...	10.8	...	6.4
6.10.11.3, ♂, Kohat, N. W. Frontier Province, West Pakistan-*Type* ...	...	...	...	6.2
15.11.1.114, ♂, Jacobabad, Sind, West Pakistan	...	11.9	...	6.3
15.11.1.118, ♂, Naundero, Sind, West Pakistan	31.8	11.0	15.7	6.4
15.11.1.120, ♀, Gambat, Sind, West Pakistan ...	31.9	11.6	16.1	6.4
91.10.7.111, ♂, Hubb, valley, Karachi, West Pakistan ...	32.2	10.7	16.4	6.7
91.11.1.12, ♂, Hubb Valley, Karachi, West Pakistan ...	34.5	11.1	17.2	6.7
Average ...	32.6	11.2	16.4	6.4

Genus *ACOMYS* Geoffroy, 1838.

Acomys cahirinus flavidus Thomas, 1917. Cairo Spiny Mouse.

1917. *Acomys flavidus* Thomas, J. Bombay N. H. Soc. 25, 2: 205. Laki Hills, Sehwan, Sind, Western India (Type Adult ♂ B. M. No. 91.11.1.11, skin alc; skull-complete).

REMARKS: Apart from the Type there is no specimen from West Pakistan in the B. M. Collection.

Genus *BANDICOTA* Gray, 1873.

Characters of *Bandicota bengalensis:*

Bullae large exceeding one-fifth of occipitonasal length, nasal less than one-thrid of occipitonasal length, palate normally more than 60% of occipitonasal length.

Bandicota bengalensis kok Gray, 1837. Indian Mole Rat.

1837. *Mus kok* Gray, Charlesworths, Mag. N. H. 1: 585, Dharwar, India (Lectotype Adult ♂ B. M. No. 30c).

1908. *Gunomys lordi* Wroughton, J. Bombay N. H. Soc. 18: 746. Kolaba district, Konkan, Bombay, India (Type Adult ♂ B. M. No. 8.913.1).

1908. *Gunomys sindicus* Wroughton, J. Bombay N. H. Soc. 18: 746. Pithoro, Central Sind Desert (Type Adult ♀, B. M. No. 8.913.7).

COLLECTING CENTRES (No. of Specimens): Umarkot (7), Pithoro (2), Shahbundar (1), Sind (2); and also Jatti, Thatta district (6) all collected by Zoological Survey of Pakistan.

HABITAT: Tropical thorn ferests.

Bandicota bengalensis wardi Wroughton, 1908.

1908. *Gunomys wardi* Wroughton, J. Bombay N. H. Soc. 18: 745. Pandritton, 5500 ft. Kashmir (Type Adult ♂ B. M. No. 8.7.6.34).

COLLECTING CENTRES (No. of Specimens): Pandritton (1), Chakothi (1), Khanmoo (1), Jhelum Bank (1)-all in Kashmir (includes Azad Kashmir).

HABITAT: Dry temperate forests.

Bandicota bengalensis bengalensis Gray and Hardwicke, 1833.

1833. *Arvicola bengalensis* Gray and Hardwicke, Illustr. Ind. Zool. 2, Pl. 21. Bengal.

REMARKS: There is no specimen from East Pakistan in the B. M. Collection.

Skull measurements (in mm.) of the specimens of *Acomys* sp. and *Bandicota* sp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
A. cahirinus flavidus				
91.11.1.11, ♂, Laki Hills, Sehwan, Sind-*Type* ...	29.5	11.1	14.3	4.7
B. bengalensis kok				
30c, ♂, Dharwar, India-*Lectotype* ...	36.2	12.4	24.5	8.1
8.9.13.1, ♂, Kolaba district, Bombay, India *Type* ...	42.4	15.4	26.7	8.0

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
8.9.13.7, ♀, Pithoro, Central Sind desert *Type* ...	38.1	12.3	25.3	8.0
27.7.15.8, ♂, Sind, West Pakistan ...	38.5	12.3	23.3	...
27.7.15.9, ♀, Sind, West Pakistan ...	38.9	13.3	24.7	8.3
47.121, ♂, Umarkot, Sind, West Pakistan ...	36.4	12.2	23.3	7.8
47.122, ♂, Umarkot, Sind, West Pakistan ...	38.2	13.4	24.8	8.2
47.125, ♀, Umarkot, Sind, West Pakistan ...	32.8	10.8	...	7.9
Z.S.P. 35, ♂, Jatti (Tatta district) Sind, West Pakistan ...	36.0	11.9	24.1	8.2
Z.S.P. 35/1, ♂, Jatti (Thatta district), Sind, West Pakistan ...	38.8	13.1	24.9	8.3
Average ...	37.6	12.7	24.6	8.1
B. bengalensis wardi				
8.7.6.34, ♂, Pandritton, Kashmir-*Type* ...	...	14.2	...	8.8
6.12.3.8, (?), Jhelum valley, Kashmir ...	39.1	13.4	...	8.9
8.7.6.32, (?), Jhelum valley, Kashmir ...	...	13.2	...	9.2
8.7.6.33 , ♂, Chakothi, Kashmir ...	34.5	11.5	22.4	8.9
8.7.6.35, ♀, Pandritton, Kashmir ...	...	13.8	...	9.1
Average ...	36.8	13.2	22.4	8.9
B. bengalensis bengalensis				
14.7.10.214, ♀, Bageswar ...	42.4	13.9	27.5	7.0
14.7.10.215, ♀, Takula ...	36.7	9.0	27.1	6.9
15.9.1.197, ♂, Darjeeling ...	35.5	11.1	23.2	6.8
Average ...	38.2	11.3	25.9	6.9

Genus Nesokia Gray, 1842.

KEY TO THE SPECIES

1. Dorsal fur colour darker. .....*indica* Gray and Hardwicke.
2. Dorsal fur colour paler and more sandy varying to yellowish-brown. .....*huttoni* Blyth.

Nesokia indica indica Gray and Hardwicke, 1832. Short-tailed Mole Rat.

1832. *Arvicola indica* Gray and Hardwicke, Illustr. Ind. Zool. 1: Pl. xi, "India".

1837. *Mus hardwickei* Gray, Charlesworths Mag. N. H. 1: 585 (Type Adult (?) B. M. No. 99a).

1851. *Nesokia griffithi* Horsfield, Cat. Mamm. Ind. Mus. 145. Pushut, N. W. Frontier, India (Type Adult (?) B. M. No. 79.11.21.401).

COLLECTING CENTRES (No. of Specimens): Khurram valley (1), Kohat (1), Ladha (S. Waziristan) (1), Hassan Abdal (1), Rawalpindi (3), Kallar Kahar (2), Gandhala (1), Pithoro (1), Umarkot (2), Panoaqil (1), Sukkur (1), Jacobabad (1), Tong (Kohistan) (3), Khojdar (1), Quetta (2), all in West Pakistan.

HABITAT: Sub-tropical dry evergreen and tropical thorn forests.

Nesokia indica huttoni Blyth, 1846.

1846. *Mus huttoni* Blyth, J. Asiat. Soc. Bengal, 15: 139. Kandahar, Afghanistan (Type Adult (?) B. M. No. 79.11.21.499).

COLLECTING CENTERS (No. of Specimens): Kalagan (1), Panjgur (7)-Baluchistan and Sind (2)-West Pakistan.

HABITAT: Tropical thorn forests.

REMARKS: There are two specimens from Sind in the B. M. Collection. Until series are examined the range of this species cannot be extended to Sind.

Skull measurements (in mm.) of the specimens of *Nesokia* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
N. indica indica				
99a, (?)-*Type* ...	...	12.3	...	7.5
79.11.21.401, (?) Pushut, N. W. Frontier, India -*Type*	...	10.8	...	7.6
7.6.7.1., ♂, Khurram valley, N. W. F. Province, West Pakistan ...	36.7	11.6	26.0	8.7
21.7.14.7, ♂, Ladha, South Waziristan, N. W. F. Province, West Pakistan ...	38.5	13.0	27.0	9.3

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek-teeth
21.7.14.8, ♂, Ladha, South Waziristan, N. W. F. Province West Pakistan ...	43.4	14.6	30.0	9.3
80.12.15.5 (?), Jacobabad, Sind, West Pakistan	34.6	10.7	24.9	9.3
91.10.7.116, (?), Tong (Kohistan), Sind, West Pakistan ...	40.6	12.3	29.5	9.2
47.130, ♂, Panoaqil, Sind, West Pakistan ...	...	10.2	...	7.6
Average ...	38.8	11.9	27.5	8.4
N. indica huttoni				
79.11.21.499, (?), Kandahar, Afghanistan-*Type*	35.7	11.8	24.5	7.4
27.7.15.10, ♂, Sind, West Pakistan ...	32.5	10.4	23.7	7.3
27.7.15.11, ♀, Sind, West Pakistan ...	31.5	10.6	24.2	7.3
56.2.29.2, (?), Kandahar, Afghanistan ...	...	11.5	24.4	7.4
74.11.21.8, (?), Kalagan, Baluchistan, West Pakistan ...	...	12.2	...	7.7
1729.*b*, (?), Kandahar, Afghanistan ...	33.7	10.1	27.7	7.4
19.11.7.76, ♂, Panjgur, Baluchistan ...	41.4	13.4	28.5	8.7
19.11.7.79, ♂, Panjgur, Baluchistan ...	38.0	12.3	26.3	8.9
19.11.7.80, ♂, Panjgur, Baluchistan ...	38.8	12.6	26.7	8.9
Average ...	35.9	11.7	25.8	7.9

Sub-family Cricetinae

KEY TO THE GENERA

1. Hind foot long; tail more than head and body; M^1 with five cusps; M^3 ringshaped; no pits between main cusps of upper molars. .....*Calomyscus* Thomas.

2. Hind foot short; tail shorter than head and body; M^1 with six cusps; M^3 not ringshaped; generally a deep pit forms between each pair of main cusps on upper molars during animal's life; bullae well inflated.....*Cricetulus* Milne-Edwards.

Genus *CALOMYSCUS* Thomas, 1905.

Calomyscus bailwardi bailwardi Thomas, 1905. Mouse-like Hamster.

1905. *Calomyscus bailwardi* Thomas, Abstr. P. Z. S. 23; and P.Z.S. 524-6. Malamir, 70 miles north-east of Ahwaz, Persia (Type Adult ♂ B. M. No. 5.10.4.68).

1920. *Calomyscus baluchi* Thomas, J. Bombay N. H. Soc. 26, 4; 939. Kalat, Baluchistan (Type Adult ♂ B. M. No. 19.11.7.65).

COLLECTING CENTRES (No. of Specimens): Kalat (2), Harboi (3)-Baluchistan, West Pakistan.

HABITAT: Tropical thorn forests.

Calomyscus bailwardi hotsoni Thomas, 1920.

1920. *Calomyscus hotsoni* Thomas, J. Bombay N. H. Soc. 26, 4; 939. Panjgur district, Baluchistan (Type Adult ♂ B. M. No. 19.11.7.63).

COLLECTING CENTRE (No. of Specimen): Gwambak-Kaul, 50 miles south-west of Panjgur (Baluchistan) (1).

HABITAT: Tropical thorn forests.

REMARKS: The status of this subspecies is doubtful due to the paucity of specimens.

Genus *CRICETULUS* Milne-Edwards, 1867.

Cricetulus migratorius cinerascens Wagner, 1848. Grey Hamster.

1848. *Hypudaeus cinerascens* Wanger, Arch. fur Nat. 1: 184. Syria (Type not known).

COLLECTING CENTRES (No. of Specimens): Kalat (Baluchistan) (1), Ladha (S. Waziristan) (2)- West Pakistan.

HABITAT: Tropical thorn forests.

Cricetulus migratorius fulvus Blanford, 1875.

1875. *Cricetus* (*Cricetulus*) *fulvus* Blanford, J. Asiat. Soc. Bengal, 46: 108. Plains of Eastern Turkestan, Pamir and Wakhan (Type not known).

COLLECTING CENTRE (No. of Specimens): Gilgit (Azad Kashmir) (2).

HABITAT: Dry temperate forests.

Skull measurements (in mm.) of the specimens of *Calomyscus* sp. and *Cricetulus* sp. *examined:*

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
C. bailwardi bailwardi				
5.10.4.68, ♂, Ahwaz, Persia-*Type* ...	24.8	9.8	13.3	3.5
19.11.7.65, ♂, Kelat, Baluchistan-*Type* ...	24.9	9.0	12.7	3.5
19.11.7.66, ♂, Kelat, Baluchistan ...	23.9	8.5	11.8	3.5
19.11.7.67, ♀, Kelat, Baluchistan ...	24.7	9.2	12.6	3.6
19.11.8.17, o, Harboi, Baluchistan ...	...	8.3	12.2	3.6
19.11.8.19, ♀, Harboi, Baluchistan ...	...	9.9	...	3.5
Average ...	24.6	9.1	12.5	3.5
C. bailwardi hotsoni				
19.11.7.63, ♂, Panjgur district, Baluchistan ... -*Type*	23.8	8.9	12.3	3.4
19.11.7.64, ♀, Gwambak-Kaul, S. W. Panjgur, Baluchistan ...	22.4	8.4	11.9	3.4
C. migratorius cinerascens				
21.7.14.4, ♂, Ladha, S. Waziristan ...	25.6	9.4	13.4	3.9
20.2.9.39, ♂, Shiraz, Persia ...	...	10.1	...	3.9
20.2.9.46, ♀, Shiraz, Persia ...	25.4	9.3	13.3	3.9
20.2.9.35, ♂, Shiraz, Persia ...	25.7	8.9	13.3	4.2
20.2.9.45, ♀, Shiraz, Persia ...	25.8	9.7	...	3.9
Average ...	25.6	9.5	13.3	4.0
C. migratorius fulvus				
81.3.1.16, ♂, Gilgit, Azad Kashmir ...	27.8	10.6	...	4.8
81.3.1.17, ♀, Gilgit, Azad Kashmir ...	26.9	10.1	13.9	4.7

Sub-family Gerbillinae

KEY TO THE GENERA

1. Soles of feet partly hairy; upper molars strictly simple prismatic and without any cusps; folds of upper molars mostly equal in size; laminae of molars always joined, and folds nearly met in the middle of tooth.....*Meriones* Illiger.

2. Soles of feet entirely naked; upper molars not strictly simple prismatic, at least originally there are clear signs of cusps or clear constrictions on laminae representing cusp spaces: laminae of molars not always joined.

(*a*) Tail dark above and below and paler along the sides; zygomatic plate angular and susally strongly thrown forwards; nasal and palate long; main outer folds of upper molars tend to be larger than the inner ones.

.....*Tatera* Lataste.

(*b*) Tail not coloured; zygomatic plate less thrown forwards; nasal and palate not long; main inner folds of upper molars larger than the outer ones.

.....*Gerbillus* Desmarest.

Genus *GERBILLUS* Desmarest, 1804.

KEY TO THE SPECIES

1. Soles of hindfeet entirely naked.

(*a*) Bullae larger. .....*nanus nanus* Blanford.

(*b*) Bullae smaller. .....*dasyurus indus* Thomas.

2. Soles of hindfeet at least partly hairy.

(*a*) Tail very long. .....*gleadowi gleadowi* Murray.

Sub-genus *Dipodillus* Lataste, 1881.

Gerbillus nanus nanus Blanford, 1875. Baluchistan Gerbil.

1875. *Gerbillus nanus* Blanford, Ann. Mag. N. H. 16: 312. Gedrosia, west of Gwadar, Baluchistan (Cotypes B. M. No. 74.11.21.39 and Ind. Mus. Calc. No. a).

COLLECTING CENTRES (No. of Specimens): Dandar (1), Kuldar (1), Pasni (1)- all in Baluchistan.

HABITAT: Tropical thorn forests.

Gerbillus dasyurus indus Thomas, 1920. Wagner's Gerbil.

1920. *Dipodillus indus* Thomas, J. Bombay N. H. Soc. 26, 4: 935. Gambat, Khairpur, Sind, India (Type Adult ♂, B. M. No. 15.11.1.100).

COLLECTING CENTRES (No. of Specimens): Kasi bridge (S. Waziristan) (1), Chakri (Salt Range) (1), Sind (1).

HABITAT: Tropical thorn forests.

Sub-genus *Gerbillus* Desmarest, 1804.

Geribillus glesdowi Murray, 1886. Indian Hairy-footed Gerbil.

1886. *Gerbillus gleadowi* Murray, Ann. Mag. N. H. 17: 246. Beruto, 15 miles south-west of Rehti, in Mirpur-Dakhri Taluka of the Rohri district, upper Sind, India (Type-not known).

COLLECTING CENTRES (No. of Specimens): Chakri (Salt Range) (1), Ghulamjogoth (3) and Hara (1) (Thar Parkar). Umarkot (11)-West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Gerbillus* spp. examined.

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
G. nanus nanus				
19.11.7.60, ♂, Pasni, Baluchistan, West Pakistan	26.8	10.4	...	3.5
19.11.7.61, ♂, Kuldar, Baluchistan, West Pakistan	26.7	10.3	14.2	3.4
19.11.7.62, ♀, Dandar, Baluchistan, West Pakistan ...	23.7	8.6	13.4	3.4
G. dasyurus indus				
15.11.1.100, ♂, Gambat, Sind, West Pakistan-*Type* ...	24.3	8.9	...	3.3
13.8.8.88, ♂, Muli, Kathiawar, India ...	24.8	9.6	13.5	3.5
13.8.8.89, ♂, Muli, Kathiawar, India ...	21.3	8.2	...	3.5
20.6.1.1, ♂, Kasi bridge, South Waziristan, West Pakistan ...	25.0	9.6	...	3.4
80.11.11.10, ♀, Sind, West Pakistan ...	22.5	8.3	13.0	3.4
Average ...	23.6	8.9	13.3	3.4
G. gleadowi				
86.2.25.1, ♀, Reti, Sind, West Pakistan-*Type* ...	28.0	10.4	...	3.8
11.3.13.1, ♀, Hara, Thar Parkar, Sind, West Pakistan ...	27.3	11.5	...	3.9
13.9.18.88, ♂, Palanpur, Gujerat, India ...	28.4	11.4	15.6	3.8

Genus *TATERA* Lataste, 1882.

Tatera indica indica Hardwicke, 1807. Indian Gerbil.

1807. *Dipus indicus* Hardwicke, Trans. Linn. Soc. London, 8: 279. Between Benares and Hardwar, U.O., Northern India (Type Adult (?) B. M. No. 11 g.).

1906. *Tatera persica* Wroughton, Ann. Mag. N. H. 17: 477, 496. Seistan, Persia (Type Adult (?) B. M. No. 6.1.2.5).

1906. *Tatera bailwardi monticola* Wroughton, Ann. Mag. N. H. 17: 477, 498. Malamir, Persia (Type Adult ♀, B. M. No. 5.10.4.43).

1917. *Tatera sherrini* Wroughton, J. Bombay N. H. Soc. 25, 1: 43. Jacobabad, Sind, India (Type old ♂ B. M. No. 15.11.1.88).

1917. *Tatera dunni* Wroughton, J. Bombay N. H. Soc. 25, 1 : 43. Ambala, Punjab, India (Type Adult ♂ B. M. No. 9.4.6.10).

COLLECTING CENTRES (No. of Specimens): Ara (2), Chakri (6), Dhalwal (1), Gandhala (4), Kallar Kahar (2), Rohtas (4), Madhopur (2), Mohli (3), Sakesar (4), Chakdulla (3), Jhalar (1)-all in Salt Range (Punjab); Kojdar (1), Las Bela (1), Mand (1), Nag (2), Panjgur (7), Pishin (3), Mach (3), Turbat (3),-all in Baluchistan; Ghulamjogoth (2), Jacobabad (4), Panoaqil (9), Ranigot (Lakhi Hills) (2), Shikarpur (1), Sukkur (1), Kotri (2), Thar Parkar (2), Karachi (1)-all in Sind; also Karachi (1) collected by Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Tatera indica indica* examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
11.*g.*, (?), Between Benares and Hardwar, India *Type* ...	45.4	18.9	...	6.0
15.11.1.88, ♂, Jacobabad, Sind, West Pakistan	41.0	16.9	21.0	6.0
9.4.6.10, (?), Ambala, Punjab, India-*Type* ...	42.8	19.0	...	6.2

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
7.11.22.18, (?), Shirarpir, Sind, West Pakistan	37.7	15.6	...	5.8
15.11.1.92, ♂, Jacobabad, West Pakistan ...	39.2	17.2	21.7	5.8
23.11.3.43, ♀, Chakri, Salt Range, West Pakistan	43.2	19.2	23.1	6.1
23.11.3.50, ♂, Rohtas, Salt Range, West Pakistan	38.2	15.7	20.9	...
23.11.3.61, ♀, Are, Salt Range, West Pakistan ...	39.4	16.8	20.9	6.2
23.11.3.74, ♀, Dhalwal, Salt Range, West Pakistan ...	40.8	17.3	21.4	6.2
25.6.10.20, ♀, Jhalar, Punjab, West Pakistan	39.5	16.1	21.4	5.9
25.6.10.21, ♂, Kotri, Sind, West Pakistan ...	...	17.7	...	6.4
25.6.10.22, ♀, Kotri, Sind, West Pakistan ...	40.6	17.6	21.8	6.3
25.6.10.25, ♀, Campbellpore, Punjab, West Pakistan ...	37.9	16.6	20.9	5.8
47.102, ♂, Panoaqil, Sind, West Pakistan ...	42.7	18.5	...	6.3
47.114, ♀, Gulamjogoth, Sind, West Pakistan ...	38.4	16.5	20.5	5.9
88.6.18.16. (?), Much, Bolan Pass, Sind, West Pakistan ...	41.2	17.6	...	5.9
Average ...	40.5	17.3	21.4	6.1

Genus *MERIONES* Illiger, 1811.

KEY TO THE SPECIES

1. Ear small, less than one-tenth of head and body; fore-claw large and soles of hind feet partly hairy.
.....*hurrianae* Jerdon.

2. Ear larger more than one-tenth of head and body; fore-claw not large and soles of hind feet naked.

(*a*) Bullae larger, over 30% of occipitonasal length.
.....*persicus baptistae* Thomas.

(*b*) Bullae smaller, less than 30% of occipitonasal length.
.....*persicus persicus* Blanford.

(*c*) Bullae extremely large more than 31% of occipitonasal length; soles of hindfeet hairy.....*crassus swinhoei* Scully.

(*d*) Bullae less extremely large, about 34% of occipitonasal length
.....*libycus erythrourus* Gray.

Sub-genus *Parameriones* Heptner, 1937.

Meriones persicus persicus Blanford, 1875. Persian Jird.

1875. *Gerbillus persicus* Blanford, Ann. Mag. N. H. 16: 312. Kohrud, 150 miles north of Isfahan, Persia (Type Adult ♀ B. M. No. 76.3.10.2).

1919. *Meriones ambrosius* Thomas, Ann. Mag. N. H. 3: 270. Dopolan, 120 miles north-east of Ahwaz, Persia (Type Adult ♂ B. M. No. 5.10.4.35).

COLLECTING CENTRE (No. of Specimen): Kalat (Baluchistan) (1), West Pakistan.

HABITAT: Tropical thorn forests.

Meriones persicus baptistae Thomas, 1920.

1920. *Meriones persicus baptistae* Thomas, J. Bombay N. H. Soc. 26: 934. Pasht Kuh, (Kharan) 27°2′N, 65 12′E., Balchistan (Type Adult ♂ B. M. No. 19.11.7.69).

COLLECTING CENTRES (No. of Specimens): Kalat (4), Kuldan (80 miles north of Turbat) (1) all in Baluchistan, West Pakistan.

HABITAT: Tropical thorn forests.

Sub-genus *Cheliones* Thomas, 1919.

Meriones hurrianae Jerdon, 1867. Indian Desert Gerbil.

1867. *Gerbillus hurrianae* Jerdon, Mamm. India, 186. Hissar, Punjab, India (Lectotype Adult (?) B. M. No. 67.2.4.1; skull-none).

1919. *Cheliones hurrianae collinus* Thomas, J. Bombay N. H. Soc. 26; 726. Kohat, N. W. F. Province, 1000-1700 ft., India (Type Adult ♀ B. M. No. 7.6.8.7).

COLLECTING CENTRES (No. of Specimens): Peshawar (1), Kohat (2)-in N. W. F. Province; Haranagar (3), Chalchra (1), Umarkot (4), Virawar (1), Gambat (6), Mirpur (Sukkur) (5), Kotri (3), Khipro (1), Karachi (3)-all in Sind; Chambai (1), Dasht (2), Nal (2), Wadh (2) all in Baluchistan; and also Karachi (near Hubb river) (8), Chuharjamali (Thatta district) (1) and Daur (Nawabshah district) (1)-collected by Zoological Survey of Pakistan.

HABITAT: Tropical thorn forests.

Sub-genus *Pallasiomys* Heptner, 1933.

Meriones libycus erythrourus Gray, 1842. Libyan Jird.

1842. *Gerbillus erythrourus* Gray, Ann. Mag. N. H. 10: 266. Sahlabad, about 12 miles South-west of Kandahar, Afghanistan (Type Adult (?) B. M. No. 44.9.15.8).

COLLECTING CENTRE (No. of Specimen): Quetta (1), Kalat (1), West Pakistan.

HABITAT: Tropical thorn forests.

Meriones crassus swinhoei Scully, 1881. Sundevall's Jird.

1881. *Gerbillus swinhoei* Scully, Ann. mag. N. H. 8: 228. Gatai, between Kandahar and Khojak Pass, about 10 miles north of Chaman, Afghanistan (Type Adult ♂ B. M. No. 81.8.16.9).

COLLECTING CENTRE (No. of Specimen): Wana (S. Waziristan) (1), West Pakistan.

HABITAT: Tropical thorn forests.

Skull measurements (in mm.) of the specimens of *Meriones* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
M. persicus persicus				
76.3.10.2, ♀, Kohrud, Persia-*Type* ...	42.3	17.4	...	5.8
5.10.4.35, ♂, Dopolan, Persia-*Type* ...	42.1	16.2	21.9	6.3
19.11.8.42, ♀, Kelat, Baluchistan, West Pakistan	39.7	16.3	20.5	5.9
M. persicus baptistae				
19.11.7.69, ♂ Pasht Kuh (Kharan), Baluchistan-*Type* ...	42.4	18.0	22.4	5.6
19.11.7.68, ♂, Kuldan, Turbat, Baluchistan ...	40.5	16.4	21.2	5.5
1911.7.70, ♂, Kelat, Baluchistan, West Pakistan	...	...	22.1	5.6
19.11.7.71, ♂, Kelat, Baluchistan, West Pakistan	40.0	16.1	21.7	5.6
19.11.7.72, ♀, Kelat, Baluchistan, West Pakistan	41.0	16.6	20.8	5.5
Average ...	40.9	16.8	21.6	5.6
M. hurrianae				
7.6.8.7, ♀, Kohat, N. W. F. Province, West Pakistan *Type* ...	35.8	12.7	...	5.2

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
11.3.13.2, ♂, Hara, Thar Parkar, Sind, West Pakistan ...	32.1	11.4	18.6	5.4
15.11.1.97, ♀, Gambat, Sind, West Pakistan ...	36.4	13.9	...	5.6
19.2.21.11, ♂, Mirpur (Sukkur), Sind, West Pakistan ...	31.2	11.2	18.6	5.3
19.11.7.47, ♂, Chambai, Baluchistan, West Pakistan ...	35.1	13.2	20.8	5.4
19.11.8.49, ♀, Wadh, Baluchistan, West Pakistan	33.4	12.3	18.9	5.3
Z.S.P. 31, ♂, Daur, Nawabshah district, West Pakistan ...	32.4	12.5	20.2	5.4
Z.S.P. 16/3, ♂, Chuhar Jamali; Thatta district, West Pakistan ...	...	12.7	19.4	5.3
Z.S.P. 104/1, ♂, Hubb River, Karachi, West Pakistan ...	...	12.9	19.8	5.1
Z.S.P. 104/4, ♂, Hubb River, Karachi, West Pakistan ...	...	13.1	...	5.5
Z.S.P 104/6, ♀, Hubb River, Karachi, West Pakistan ...	...	...	19.8 ...	5.7
Z.S.P. 104/7, ♀, Hubb River, Karachi, West Pakistan ...	...	13.3	...	5.4
Average ...	33.8	12.7	19.5	5.4
M. libycus erythrourus				
44.9.15.8, (?), Shalabad, Afghanistan *Type* ...	38.0	14.8	...	...
19.11.8.43, ♂, Kelat, Baluchistan, West Pakistan	39.8	15.7	21.5	5.6
M. crassus swinhoei				
81.8.16.9, ♂, between Kandahar and Kohjak Pass-*Type* ...	29.4	10.2	16.1	4.2
21.7.14.3, ♂, Wana, South Waziristan, West Pakistan ...	31.9	11.8	18.0	4.2

Sub-family Microtinae

KEY TO THE GENERA

1. M 3/3 reduced in size; cheek teeth rooted in adult; incisors large; infraorbital foramen not narrow, lacking external plate or covering; skull ridges fuse to form a sagittal ridge which extends backwards

over parietals to lambdoid crest; tail shorter than hindfoot. .....*Ellobius* Fischer.

2. M 3/3 not reduced in size; cheekteeth rootless in adult, incisors not large; infraorbital foramen narrow; skull ridges fuse in the interorbital region and never form a ridge.

(*i*) supraorbital ridges remain separate in adult; palate short; cheekteeth with relatively wide folds. .....*Alticola* Blanford.

(*ii*) supraorbital ridges fuse to form median interorbital crest; palate long; cheekteeth without wide folds. .....*Hyperacrius* Miller.

Genus *ELLOBIUS* Fischer, 1814.

Ellobius fuscocapillus Blyth, 1843. Afghan Mole-Vole.

1842. *Georychus fuscocapillus* Blyth, J. Asiat. Soc. Bengal, 10: 926, nom. mud. 1843, J. Asiat. Soc. Bengal, 11: 887. Quetta, Baluchistan (Type-not known).

Collecting Centre (No. of Specimens): Mach (Baluchistan) (2)-West Pakistan.

Habitat: Tropical thorn forests.

Genus *ALTICOLA* Blanford, 1881.

KEY TO THE SPECIES

1. M^3 reduced, with very short heel and only two clear inner salient angles; tail very short less than a quarter of head and body length. .....*stoliczkanus stracheyi* Thomas.

2. M^3 less reduced, with at least three inner salient angles; tail less shorter, usually exceeding 30% of head and body length.

(*i*) Length of upper tooth-row less than 6 mm. .....*roylei blanfordi* Scully.

(*ii*) Length of upper tooth-row exceeds 6 mm. .....*roylei montosa* True.

Alticola roylei blanfordi Scully, 1880. Royle's High Mountain Vole.

1880. *Arvicola blanfordi* Scully, Ann. Mag. N. H. 6: 399. Gilgit, between 9,000 and 10,000 feet, Kashmir (Lectotype Adult ♀ B. M. No. 81.3.1.22).

Collecting Centres (No. of Specimens): Gilgit (2) and Skardu (1)-Kashmir.

Habitat: Dry temperate forests.

Alticola roylei montosa True, 1894.

1894. *Arvicola montosa* True, Proc. U. S. Nat. Mus. 17: 11. Central Kashmir, 11,000 feet (Type U. S. Nat. Mus. No. 20145/35508.

1905. *Microtus imitator* Bonhote, Ann. Mag. N. H. 15: 197. Tullian, 11000 ft. Kashmir (Type Adult ♂ B. M. No. 5.1.4.12).

COLLECTING CENTRES (No. of Specimens): Kaghan valley (5), Safed Koh (above Parachinar) (1)-West Pakistan.

HABITAT: Dry temperate forests.

Alticola stoliczkanus stracheyi Thomas, 1880 Stoliczka's High Mountain Vole.

1880. *Arvicola stracheyi* Thomas, Ann. Mag. N. H. 6: 332. Ladak, Kashmir (Type Adult (?) B. M. No. 60.5.4.113).

COLLECTING CENTRE (No. of Specimen): Khurram valley (N.W.F. Province) (1)-West Pakistan.

HABITAT: Dry temperate forests.

REMARKS: Ellerman and Morrison-Scott (1951) have stated that this species occurs from Kashmir to Mt. Everest, Tibet and Possibly Kansu, China but the specimen collected from the Khurram valley (N.W.F. Province) West of Kashmir State extends its range also to the west of Kashmir.

Genus *HYPERACRIUS* Miller, 1896.

KEY TO THE SPECIES

1. Larger form with occipitonasal length more than 24 mm. .....*wynnei* Blanford.
2. Smaller form with occipitonasal length not exceeding 24 mm.; ear most often more than one-tenth of head and body length. .....*fertilis fertilis* True.

Hyperacrius wynnei Blanford., 1881. Murree Vole.

1881. *Arvicola wynnei* Blanford, J. Asiat. Soc. Bengal, 1880, 49, 2: 244 Murree, Punjab (Cotype Adult ♂ B. M. No. 8.3.9.18).

COLLECTING CENTRES (No. of Specimens): Murree (12), Dunga gali (1)-West Pakistan; Sardallu (Kashmir) (3).

HABITAT: Sub-tropical dry evergreen and dry temperate forests.

Hyperacius fertilis fertilis True, 1894. True's Vole.

1894. *Arvicola fertilis* True, Proc. U. S. Nat. Mus. 17: 10. Pir Panjal Mountains, 8,500 feet, Kashmir (Type U. S. Nat. Mus. No. 20147, 35510).

COLLECTING CENTRES (No. of Specimens): Kaghan valley (5), Bogarmang glen (Hazara) (4) West Pakistan; Rattoo (Gilgit) (4)-Azad Kashmir.

HABITAT: Dry temperate forests.

REMARKS: Ellerman and Morrison-Scott (1951) have limited the distribution of this species to Kashmir but specimens from the Kaghan valley and Hazara district in the B. M. Collection extend its range to the north-western parts of West Pakistan.

Skull measurements (in mm.) of the specimens of *Ellobius* sp., *Alticola* spp., and *Hyperacrius* spp. examined:

Brit. Mus. No., Sex and Locality	Occipito-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
E. fuzcocapillus				
19.11.7.85, ♀, Mach, Baluchistan, West Pakistan	30.6	10.4	26.3	8.5
86.10.15.12, (?), Gulran, Afghanistan ...	30.4	10.1	25.0	8.0
86.10.15.14, (?), Karad Khana, Afghanistan ...	29.2	8.8	24.7	8.0
A. roylei blanfordi				
81.3.1.22, ♀, Gilgit , Azad Kashmir-*Lectotype* ...	27.3	8.3	14.0	5.6
8.3.9.17, ♂, Gilgit, Azad Kashmir-*Lectotype* ...	26.5	8.3	...	5.7
81.3.1.23, (?), Gilgit, Azad Kashmir ...	...	...	...	5.3
5.10.8.5, ♂, Skardu, Kashmir ...	...	7.4	...	5.7
50.793, ♂, Pattan Valley Lahur, Kashmir ...	23.3	7.1	14.2	5.8
50.794, ♀, Pattan Valley Lahur, Kashmir ...	24.2	7.4	13.7	5.4
Average ...	25.3	7.7	13.9	5.6
A. roylei montosa				
5.1.5.12, ♂, Tullian, Kashmir-*Type* ...	...	9.6	...	6.0
8.10.3.9, ♂, Kaghan Valley, West Pakistan ...	...	...	...	6.2
8.10.3.10, ♂, Kaghan Valley, West Pakistan ...	25.2	7.6	14.5	6.1
12.11.26.12, ♀, Kaghan Valley, West Pakistan	...	8.1	...	6.2
12.11.26.13, ♀, Kaghan Valley, West Pakistan	22.6	7.5	14.2	6.1
Average ...	23.9	8.2	14.3	6.1
A. stoliczkanus stracheyi				
60.5.4.113, (?), Ladak, Kashmir-*Type* ...	...	8.3	14.4	5.9
6.12.2.2, ♀, Khurram Valley, West Pakistan ...	22.4	6.1	11.8	5.4

Brit. Mus. No., Sex and Locality	Occipital-nasal length	Nasal length	Zygomatic width	Upper cheek teeth
H. wynnei				
8.3.9.18, ♂, Murree, West Pakistan-*Type* ...	27.0	8.2	18.8	7.0
8.10.4.4, ♂, Murree, West Pakistan ...	...	8.5	...	6.8
89.1.26.1, ♂, Murree, West Pakistan ...	25.0	7.5	17.2	6.6
91.10.7.142, (?), Murree, West Pakistan ...	...	...	...	7.0
50.768, ♂, Sardallu, Kashmir ...	...	7.3	...	6.1
50.770, ♀, Murree West Pakistan ...	...	7.2	...	6.1
Average ...	26.0	7.7	18.0	6.6
H. fertilis fertilis				
9.11.26.4, ♂, Kaghan Valley, West Pakistan ...	...	7.0	...	6.0
10.10.12.2, ♀, Rattoo (Gilgit), Azad Kashmir ...	21.3	6.6	...	6.0
12.11.26.14, ♂, Kaghan Valley, West Pakistan	23.1	7.0	...	6.2
12.11.26.15, ♀, Kaghan Valley, West Pakistan	21.2	6.7	15.0	6.2
12.11.26.16, ♂, Kaghan Valley, West Pakistan	22.8	7.0	14.6	5.9
12.11.26.18, ♀, Kaghan Valley, West Pakistan ...	...	6.7	...	6.0
12.11.26.19, ♀, Kaghan Valley, West Pakistan ...	...	7.7	...	6.1
Average ...	22.1	7.0	14.8	6.1